389.8 F936
LIBRARY

FOOD MANUFACTURE

PUBLISHERS: LEONARD HILL, LTD., 17, STRATFORD PLACE, W.1 JULY, 1935

Wm GARDNER & SONS (GLOUCESTER)
ENGINEERS GLOUCESTER
A MIXER TO LOOK UP TO!
GARDNER'S
Wm. GARDNER & SONS (GLOUCESTER) LTD. GLOUCESTER

DRYDEX
FLAVOURS
Regd.

FOR USE IN ALL FLAVOURED POWDER & CRYSTAL GOODS

SUCH AS

LEMONADE CRYSTALS

RASPBERRYADE CRYSTALS

CAKE AND SPONGE MIXTURES

BLANCMANGE AND JUNKET POWDERS

CUSTARD AND ICE CREAM POWDERS

JELLY CRYSTALS & FRUIT SALTS

ORANGEADE CRYSTALS

SUMMER & WINTER DRINK TABLETS
STILL OR EFFERVESCENT

ELIMINATE LOSS OF STRENGTH DURING STORAGE BY USING DRYDEX

Manufacturers:

A. BOAKE, ROBERTS & CO. LTD.

Established 1869

LONDON, E. 15

Telegrams: "BOAKE, 'PHONE, LONDON." Telephone: MARYLAND 5511 (7 lines)

Index to Advertisers, see pages v & vi

A JOURNAL DEVOTED TO THE PRODUCTION AND MANUFACTURE OF: Chocolate, Confectionery, Biscuits, Bread, Cake; Jam; Glacé, Candied and Preserved Fruits; Fruit Juices and Cordials; Jellies, Honey and Lemon Curd; Cheese and Milk Products, Infant, Breakfast and Invalid Foods; Ice Cream; Canned Foods; Meat, Fish and Vegetable Products; Soups, Pickles, Sauces, Pastes and Extracts, and all edible commodities involving a process of manufacture.

FOOD MANUFACTURE

Incorporating Canning, Packing and Preserving.

Volume . . . X
Number . . . 7

JULY . . . 1935

CONTENTS

PAGE

THE EDITOR'S COMMENTS
by Dr. H. B. Cronshaw, B.A., Ph.D., A.I.C. 225

FOOD INDUSTRIES IN CZECHOSLOVAKIA
by J. G. F. Druce, M.Sc.(Lond.), R. Nat. Dr. (Prague), F.I.C. 229

JAM TROUBLES
by R. S. Potter, B.Sc., A.I.C. . . . 232

THE MANUFACTURE OF MALT EXTRACT
by Thomas McLachlan, A.C.G.F.C., F.I.C. . 234

THE FOOD GROUP AT NORWICH . . . 237

SPECIAL SUGAR FOR THE CANNING OF FRUIT 238

2,000 YEARS AGO 238

ADVERTISING FOOD PRODUCTS: *A Survey by B. C. Saville* 239

RATE OF HEAT TRANSFER
by J. C. Marquardt 242

AMERICAN CHEMICAL SOCIETY AND FOOD MANUFACTURE 248

BOOK REVIEWS 249

REFRIGERATION IN THE WINE INDUSTRY . 250

INDUSTRIAL NEWS 251

INFORMATION AND ADVICE 256

NEW COMPANIES 259

RECENT PATENTS 260

RECENT TRADE MARKS 261

SUBSCRIPTION

Single Copies - 1/-
Annual Subscription
12 Issues - - 10/-

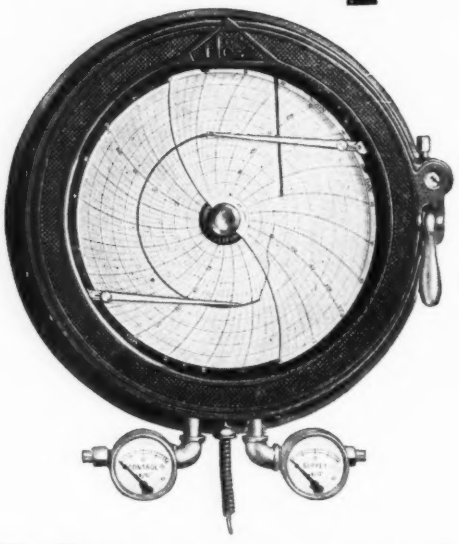
Published on the first day of the Month
by
LEONARD HILL LIMITED
17, Stratford Place, London, W.1
Telephone: Mayfair 7383
(Private Branch Exchange).

The Editor will be glad to consider contributions from those engaged in the Food Industry. Articles intended for publication should be of a practical nature and accompanied by photographs or drawings when possible.

The Figures Show . . . Considerable Improvement

Profits must inevitably increase following the introduction of Negretti & Zambra Automatic Temperature Controllers. Losses due to spoilage and the consequent rejection of consignments are limited. Overheads are automatically cut down, and by standardising your product sales automatically increase.

Whatever your process, we make a controller to suit . . . one that will save its cost time and time again by its economies and betterment of your products.



The superiority of Negretti & Zambra Controllers is due to sound design, best material and finest workmanship. They are sensitive and precise in action, yet robust in construction. Easy to instal, and guaranteed for two years.

Send for our latest catalogue or ask for one of our representatives to call.

NEGRETTI & ZAMBRA

AUTOMATIC CONTROLLERS

NEGRETTI & ZAMBRA, 38 HOLBORN VIADUCT, LONDON, E.C.

FOOD MANUFACTURE

Vol. X, No. 7 July, 1935

The Heinz Fellowship

IN THE report of progress at the Mellon Institute during 1934-1935 it is stated that in connection with the multiple industrial fellowship of H. J. Heinz Co. (1022), E. R. Harding, senior fellow, developed two new strained foods during 1934. One is a strained cereal for use in the feeding of babies and in special diets. The other is strained apricots, prepared from fresh, undried fruit.

It is stated, also, that a great deal of work was done on vitamin C in relation to its distribution in vegetable varieties, the effect of harvesting and storage of the vegetable, and its destruction in various processes of manufacture.

Pie Crust

Our American friends have lately been tackling the problem of pie crusts, presumably to test out the old saying that like promises they were made to be broken. With characteristic energy, a committee under the chairmanship of C. B. Kress has attacked the problem in systematic fashion in collaboration with large manufacturers of pies and also those engaged in making pie flour. The report is a notable achievement when one considers that the members of the committee were situated at great distances from each other and all contacts had to be made by correspondence. After a round robin for ideas, a complete testing procedure which incorporated the best ideas of each member was decided on. Twelve samples were sent to each, and they then set to work on various chemical and baking tests. It is very interesting to note that the latter included bread-baking tests as well as pie-crust tests. The report states that there is much ground for hope that pie flour can be judged by the usual chemical analysis coupled with a standard baking test. Naturally a very close examination for minute differences will require a pie-crust baking test, but the committee believe that a close study of the chemical, physical and baking characteristics of a flour, if properly interpreted, will harmonise with an actual pie-baking test.

Artificial Honey

Any information which helps to break the obscurity associated with the practice of preparing mixtures of artificial and natural honeys is welcome, although the extent of this practice is difficult to gauge. Probably the information recently supplied by E. Waltzinger (*Z. Unters. Lebensm.*, 1935, p. 77) is more useful to the public analyst than it is to the manufacturer, although both will be interested to know that in a factory visited by the author (presumably in Germany) the artificial honey was produced by heating sucrose to 90° C. with tartaric acid in a concentration of 0·22 per cent.

Although the acid content was not great enough to bring the acidity of the product above the permitted maximum, it proved adequate to destroy the diastase of the natural honey which was subsequently mixed with the artificial product, since honey diastase is particularly sensitive to acid.

Shredded Suet

How much rice flour can one add to suet in the preparation of the shredded article? Is there any legal standard? These are questions which at one time or other have troubled most of us. Mr. G. D. Elsdon, B.Sc., F.I.C., County Analyst for Lancashire, has something to say about this matter in his Annual Report recently published.

The amount of rice flour which has been regarded as necessary for the production of shredded suet as an article of commerce in a state fit for carriage, and which does not fraudulently increase its bulk, weight, or measure, has varied considerably. Owing to these differences, the Council of the Society of Public Analysts, in December, 1931, expressed the opinion that, pending the establishment of any legally authorised standard, shredded suet should contain not less than 83 per cent. of fat. For the present, therefore, Mr. Elsdon is adopting this as the standard for shredded suet. Any sample which contains less than 83 per cent. of fat is described as adulterated. One of the samples submitted to him was found to contain only 80 per cent. of fat. The

sample was returned as adulterated, the opinion being expressed that it contained an excess of 3 per cent. of rice flour.

Since the year 1928, 63 samples of shredded suet have been examined. The amounts of fat found in these cases varied from below 77 per cent. (two samples) to 91 per cent. One sample contained no starch. In the case of 25 out of the 63 samples, the fat content ranged from 85 to 87·9 per cent.

Wheat Starch in Mustard

Mr. Elsdon makes some interesting remarks about the question of adding wheat starch, or other starch, to mustard. One sample of mustard was found on examination to contain 10 per cent. of starch foreign to mustard, having the characteristics of wheat starch.

Mustard, when sold in tins, often contains proportions of wheat starch of this order, but in these cases the label includes, usually in very small type, some such phrase as: "This Mustard is sold as a mixed article and is warranted to be of choice quality". It is stated that the admixture with starch is made in order that the mustard shall not become hard after packing, or, alternatively, it is stated that most purchasers desire their mustard mixed with starch in this way. That such admixture is not necessary for the production of the article in a fit condition for sale is shown by the fact that in many cases when mustard is sold loose no foreign starch is present. It may further be stated that, owing to the natural variations in the composition of mustard, it would be difficult for the average palate to detect a diminution in pungency of mustard to an extent of about one-tenth.

SO_2 in Sausages

Mr. Elsdon found that six samples out of twenty-one examined during the year contained various amounts of sulphur dioxide without any notice having been given to the customer of its presence.

As everyone knows, the Public Health (Preservatives, etc., in Food) Regulations decree that no food shall be manufactured for sale or sold which contains any added preservative, except in the cases of the foods mentioned in Part I of the First Schedule to the Regulations.

It is stated in this schedule that sausages may contain as a preservative up to 450 parts of sulphur dioxide per million providing that, as is set out in the Second Schedule, the article is labelled in the prescribed manner as containing preservative or, that the person who exposes or offers any such article for sale by retail shall at the time when it is so exposed or offered cause a notice to the effect that the article contains preservative to be exhibited in a conspicuous place so as to be easily readable by a customer.

Evaluation of Fruit Lands

Two reports, recently issued, indicate the modern tendency to introduce scientific planning into the fruit industry on the basis of the evaluation of land types. The idea is to correlate the fruit growing values of the different parts of a particular area with their soil, topography, etc., in conjunction with the local climate.

One of these reports comes from the Agricultural Experiment Station at the Michigan State College and has been compiled by J. O. Veatch and N. L. Partridge. It is entitled "The Utilisation of Land Types of Fruit Production, Berrien County, Michigan". The authors state that this method of rating land has evident limitations; nevertheless, it should be of value to owners of established orchards and to those considering locations for new plantings. The fruit industry is on a highly competitive basis, and the advantage lies with the grower on the best natural site, other things being equal. With this work begins a systematic inventory of the resources of the State in fruit land, which our American friends consider is essential for broad planning for the horticultural industry.

Survey in Kent

That the same views are held over here is evident from the appearance of a bulletin issued by the Ministry of Agriculture and Fisheries on a "Survey of the Fruitgrowing Areas on the Lower Greens and in Kent". Mr. Bane of the East Malling Research Station and Mr. Gethin Jones of the South-Eastern Agricultural College have joined forces in this work.

Of the twenty-six types of soil which have been recognised, only about six are regarded as naturally good for fruit growing, though others are classified as average or fairly good. Good soils cover extensive areas, and the Report indicates that fruit of dessert quality might be grown more extensively in the area, rather than that of culinary grade as at present.

This Report is already welcomed by the more progressive trade organisations as a valuable contribution to the age-old industry of fruit-growing.

Haddock Meal

Various studies have been made of the effect of the different methods of manufacture on the nutri-

tive value of fish meals as measured by chemical and biological means. Recently (*Ind. and Eng. Chem.*, April, 1935), Wilgus, Norris, and Heuser at Cornell University have reported the results of an investigation on the comparative effects of wet- and dry-rendering and of variations in the temperature and length of application on the nutritive value of haddock meals, using as criteria the relative protein efficiency and the relative growth-promoting vitamin G content as determined by white leghorn chicks.

Dry-rendered meals were found to possess a greater protein value and 50 per cent. more vitamin G than those wet-rendered by similar processes of drying. A flame-dried meal was of inferior value. The use of vacuum with steam-drying materially preserved the vitamin G content but did not improve the relative protein efficiency over that obtained without the use of vacuum. Doubling the size of charge had a slight beneficial effect. By not pre-grinding the raw scrap, the vitamin G content was best preserved.

Kumiss

An interesting paper presented by Professor A. Voytkievich of the Laboratory of the Institute of Agricultural Bacteriology in Moscow to the Tenth World's Dairy Congress recorded the results of a scientific expedition, which included a group of bacteriologists, to the Kumiss district of Schafranovo in Bashkira. Kumiss is prepared exclusively from raw mare's milk. It was found that the microflora of Kumiss consists of lactic acid bacteria, *Bact. Caucasicum* Löhnis (*Thermobacterium* Orla Jensen) and yeasts of the Torulaceæ family. The presence of peptone and amino-acids does not result from proteolysis; they are original constituents of the mare's milk. "Strong" Kumiss has an alcoholic content of about 2 per cent.

Cold Storage of Fish

At the Torry Research Station, Aberdeen, M. M. Stewart and G. A. Reay have recently carried out some important work on the keeping qualities of fish which have undergone a freezing, storage, and thawing cycle.

Staleness in fish is largely due to bacterial action, and may be expressed in terms of the bacterial count or the products of bacterial action (amount of volatile nitrogen). At the same time changes in the texture of the flesh and the nature of the protein take place.

"Thawed fish" refers to fresh fish frozen in brine at -21° C., glazed, stored at -21° C. for periods ranging up to six weeks, and finally thawed in running water at 8° C.

Stewart compared the rate of bacterial growth in two lots of fish kept in melting ice for fifteen days—namely, (*a*) fresh fish, and (*b*) fish which had been frozen, and thawed. He found no difference in the rate of growth. After fifteen days' storage, however, changes in the protein of the muscle occurred more quickly in fish which had been stored for some time in the frozen state.

Similar conclusions were arrived at by Mr. Reay. Although storage at -21° C. completely preserves freshness in the bacteriological sense, it permits slow changes in quality. Therefore, cold storage should never be employed with the idea of keeping fish for an unlimited time.

Ice preserves freshness in thawed fish, previously stored at -21° C., to the same extent as in fresh fish, but permits rapid changes in quality. The consumer should thus receive either frozen fish or fish immediately after thawing.

Chilled Beef

We have made reference on several occasions to the work of C. H. Lea on the fats of chilled beef. A recent paper published in the *Journal of the Society of Chemical Industry* brings the subject up to date. Deterioration of flavour in chilled beef fat may be produced by micro-organisms, odour absorption or oxidation. In the first case the rise in acidity, which almost invariably accompanies the deterioration in flavour, varies considerably owing to the different abilities of the organisms to hydrolyse fat. Lea states that in samples taken from chill rooms of retail shops a free acidity of 1·02 (as percentage of oleic acid) in one sample was associated with a worse flavour than an acidity of 1·36 per cent. in another, while in a further sample the acidity was as high as 5·73 per cent., although there were no visible organisms. Appreciable oxidation of chilled beef fat stored in air does not generally occur unless there is undue exposure to light, but the use of carbon dioxide atmospheres has made storage practicable for much longer periods. The influence of light in the development of rancidity is important, and we referred to the work of Coe and LeClerc on the photochemical action in rancidity formation as long ago as November, 1932. In the case of meat after long periods, bleached greyish or white patches may occur on the external fat owing to the conversion of oxyhæmoglobin into methæmoglobin, and these have an increased peroxide oxygen value.

Diet and Climate

The Royal Society of Arts has now issued a reprint of two lectures delivered by Dr. H. Chick, of the Lister Institute, during the early part of the year, on the subject of diet and climate. The object of the lectures was to show how the general principles guiding correct nutrition can be applied to the special problems arising in different climates.

Although a great deal of exact knowledge is now available and ready to be applied, dietetics is not an exact science, and the lecturer pointed out that there is need for an admixture of common sense and intelligent adaptation to particular circumstances, and of course it is necessary to avoid the dangers of faddism.

Milk

Dr. Chick instanced the case of pasteurised or boiled milk. Milk so treated has a slightly impaired nutritional value; it loses most of its antiscorbutic value, which is never great, and some portion of its content of lime salts is converted to a less digestible form. In this country, however, the heating of milk before consumption is, in Dr. Chick's view, a necessity, since the danger of milk-borne disease is so great. Tuberculosis alone is widespread among our dairy cattle, and is a menace to children taking large amounts of raw milk. Yet, says Dr. Chick, there are people who insist on the need for raw milk on dietetic grounds, although the defects in heated milk can be simply repaired by giving a little extra fruit juice or vegetable food.

pH of Tomatoes

R. B. Harvey and R. R. Fulton, formerly of the U.S. Bureau of Plant Industry, have recently investigated the relation of the hydrogen ion concentration and total acidity to the taste of tomatoes. These were determined on twenty-six varieties of ripe tomatoes grown and collected under the same conditions in closely adjoining plots. The hydrogen ion concentration varied from *p*H 4·147 to 4·565. The total acidity varied from 0·318 to 0·610 per cent. malic acid.

In estimating the sourness to taste of the varieties it was found that the globe-shaped red tomatoes ought generally to seem less sour to taste, and the yellow varieties somewhat more sour than the average for red tomatoes, disregarding variations in the sugar content.

Action of Glucose on Metals

In a letter to *Chemistry and Industry* (April 19, 1935), R. C. Tranent records some tests he made for the purpose of determining the possibility of corrosion of various pipe lines, receivers, etc., by dilute neutral liquid glucose syrups. Thin sheets of the metals to be tested were placed in a 1·10 sp. gr. solution of the above syrup. Approximately 20 sq. cm. of the metal was immersed in 250 ml. of the liquid of *p*H 6·8, roughly sterilised and kept for three weeks. At the end of that period the solutions were examined and the loss in weight of the metals determined. In the case of iron and copper the liquid was definitely tinted by the salts formed and a slight mould growth was in evidence. The *p*H of both solutions was 5·2 to 5·4, while those of the others varied from 6·2 to 6·6.

The following percentage losses in weight were recorded: Tin, 0·008; aluminium, 0·045; zinc, 0·054; iron, 0·383; copper, 0·66.

Research at Prince Rupert, B.C.

The Pacific Fisheries Experimental Station at Prince Rupert, British Columbia, continues to investigate the vitamin properties and industrial applications of fish oils produced, or capable of being produced, in Canada. The numerous enquiries which this station receives bear testimony to the interest which is being taken in this subject. Recently the Director of the station, N. M. Carter, has prepared a summary of the relevant literature, which should prove very helpful.

A further report on the variations in vitamin potency of pilchard oil has now been completed by B. E. Bailey.

Crystals in Canned Salmon

R. H. Bedford, of the same station, discusses the occasional development of crystals of magnesium ammonium phosphate in canned salmon. Sometimes they are quite small, and then impart a grittiness to the product.

It is just possible that these crystals may be mistaken for glass, as they are colourless, transparent and hard, with somewhat sharp edges, and when placed in the mouth they dissolve so slowly that they are tasteless. But, of course, they are quite harmless.

The conditions under which they may be formed have not been fully investigated. There may have been physiological peculiarities of the fish, variations in the retorting temperature or conditions of cooling, but one of the most probable causes is the careless handling of the fish leading to undue bacterial decomposition.

A Jam Advertisement. The woman is drinking "tea" made from jam, like "black-currant ÞS × 8 tea."

The child eats jam alone! It is very stiff and is packed in waxed paper containers, glass jars being unknown.

FOOD INDUSTRIES IN CZECHOSLOVAKIA

By J. G. F. DRUCE, M.Sc. (Lond.), R.Nat.Dr. (Prague), F.I.C.

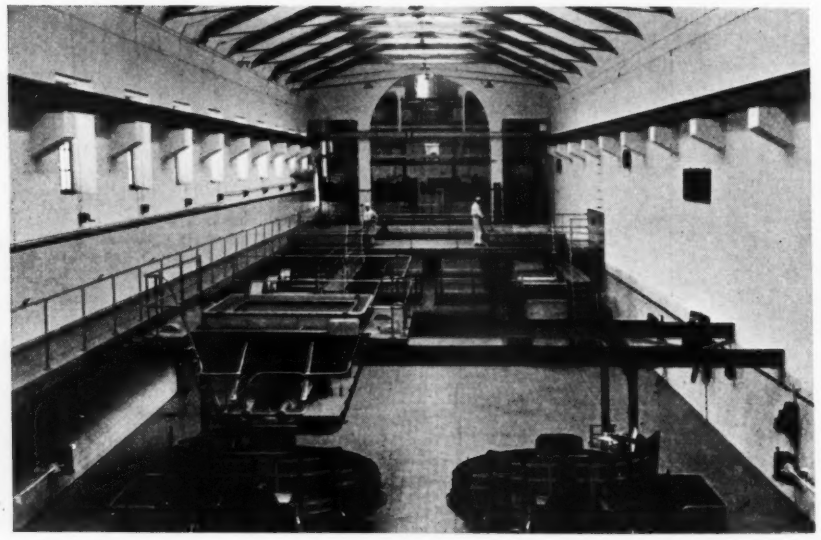
ALTHOUGH A comparatively small country in the centre of Europe, Czechoslovakia is the third largest continental producer of sugar, which is extracted at some 160 factories scattered over the State. Sugar at one time formed a profitable item of export, but of recent years most importing countries, especially ourselves, have fostered home production, and the Czechoslovak sugar exports have dwindled to a fraction of their former total. Nevertheless, the total production for 1934 was over 600,000 tons, whilst for some years it had been well over a million tons.

Naturally there is nowadays some difficulty in marketing this huge output. Efforts have recently been made to use more in the manufacture of such foodstuffs as cakes, confectionery, chocolates, preserved fruit, and jams. A certain amount is also taken by the distilleries for fermenting into alcohol for both drinking and industrial purposes. The molasses, which were previously used in a similar way, have since found application as cattle food and for the manufacture of citric acid by fermentation with special micro-organisms.

The sugar factory at Dolní Beřkovice.

British Machinery Employed

The chocolate and confectionery industry has existed for a long time in Czechoslovakia and has developed considerably since the war. There are some eighty establishments, some of them employing many hundreds of workfolk and turning out thousands of tons of high-class chocolates and sweets each year, often using British machinery in the various processes. Some of their products are exported, especially to Southern and Eastern Europe, although Czechoslovakia still imports much from Switzerland, France, Germany, England (high quality makes), and even America. The cacao beans required for the cocoa and plain



Inside a Margarine Factory in Czechoslovakia. The open arrangement of the plant with very little structural work or equipment on the floor is excellent. Good lighting and extreme cleanliness are evidently regarded as highly important.

chocolate are imported from British colonies, and all the modern refinements are adopted to ensure a smooth and uniform product. The costs of the raw materials, including the sugar, fats, and flavourings, make the margin of profit a very narrow one, and the industry is anxiously concerned over the low level to which selling prices have fallen.

There are over 400 jam and conserve factories, forty of them being quite important concerns, yet the amount of jam consumed in Central Europe is very much below that of Great Britain and attains only about 3 lb. per person per annum. Central Europeans generally favour a much stiffer marmalade—as all jam is called, irrespective of the fruits used in its manufacture—than we are accustomed to. This is due to the fact that their jams are used almost exclusively for cooking—*e.g.*, for filling tarts and pastries and not for spreading upon bread and butter. The consistency renders it possible for the manufacturer to wrap it in cellophane and enclose it in cardboard boxes instead of glass jars.

Blue Plum "Marmalade"

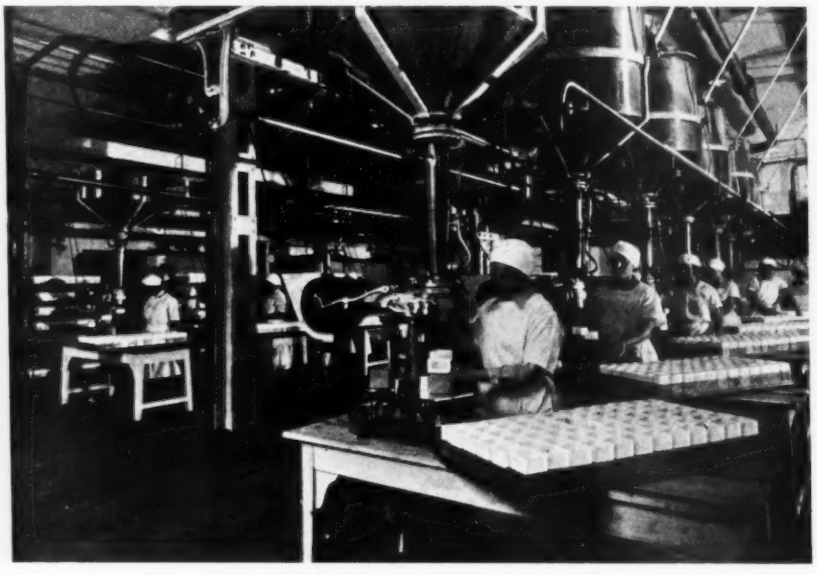
The most favoured jam is a very thick dark blue plum "marmalade". Strawberries, raspberries, and some other fruits alone are not easily stiffened up to the required consistency expected by the Czechoslovak housewife, and mixed jams are not very popular. The wild whortleberries from the forest areas, however, find a ready market among the jam makers. Whortleberry jam is rather palatable, and, after plum jam, is the most widely used.

Candied or crystallised fruits enjoy a seasonal demand around Christmas and the New Year, and some are exported. They are usually made in the rural factories situated in fruit-growing areas. The just-ripe fruit is cored or stoned and then covered with sugar solutions of increasing strength until, upon draining and drying, sugar crystallises upon the fruit. The roadsides, especially in the west of the republic, are lined with plum, cherry, apple, or walnut trees, and these usually yield a useful crop, but in the winter of 1928-9 some 60 per cent. of the trees were destroyed by the severe frosts. Since then the crops have been much below normal and the conserve manufacturers have had to purchase fruit from Jugoslavia and California.

Among the by-products of the Czechoslovak jam industry are the raspberry and currant juices, which are used for making non-alcoholic beverages and various fruit essences and pectin preparations.

The canning industry has not developed very rapidly because the public are not yet alive to the advantages of this type of conserve. Most of the tinned goods sold in Prague and other towns are imported, but fruit, and more especially vegetables, are now being canned at several centres. The uncertainty of crop yields has constituted a deterrent to the extensive development of canning, since crop failure has meant that fruit or vegetables have had to be imported if the factories were to be kept running. Moreover, the industry is very seasonal, lasting only as long as the crops come in.

Filling Cartons with Margarine in a Factory in Czechoslovakia. This process of filling the semi-liquid product, which is weighed by hand, is somewhat unusual. The clean conditions under which the work is done and the arrangement of the plant are again striking features.



Margarine Industry Highly Developed

The acute war-time shortage of fats led to the post-war development of the margarine industry, which has since maintained its position in spite of the economic depression, which, it may be pointed out, is only just beginning to abate in Central Europe. The home production of butter is not adequate for the needs of the whole population. Moreover, the price of margarine has made it the most purchased edible fat for the bulk of the people. It is made in large quantities at Ústí-nad-Labem (Aussig) and at Rakovnik. The most modern methods of manufacture are followed, using first quality edible oils (mostly imported as nuts, etc., from British colonies and elsewhere) and local milk.

The dairy industry is largely in the hands of farmers' co-operative associations, and the biggest dairies are naturally near Prague. Cheese is made in certain country districts in Moravia and Slovakia; that from the Liptov county in North Slovakia enjoys extensive popularity and, like Prague hams, is known beyond the frontiers of Czechoslovakia itself.

Milling Most Important Industry

Milling is perhaps one of the most important of the food industries in the State, and, although the thousand odd mills could supply all the country's needs, considerable amounts of flour are still imported—*e.g.*, from Hungary. There are one or two large bakeries in most of the cities, but bread is mostly made in very numerous small establishments. Apart from these private concerns, there are several co-operative organisations that specialise in supplying their members with bread and rolls. The rolls are often sprinkled with poppy seed, caraway seed, or coarse salt before baking. At Karlsbad a special kind of wafer called Oplatky, or Oblaten, is made and finds favour on the Czechoslovak tea-table, and is not unknown in England.

Neither brewing nor the bottling of natural waters strictly come within the scope of an article on Food Manufacture, although beer has been shown to possess definite food values, and natural mineral waters like the Mattoni's Kysibelka and others bottled at Czechoslovak and other continental sources are known to possess valuable health-giving qualities. Pilsener and Budweis beers from Plzeň and Budějovice owe something to the natural waters, the hops, and the malt, which is further used in medicinal food preparations. The salines from the natural waters, too, play their part in the making of a variety of foodstuffs, from bread and wafers to sweets and other confectionery.

U.S.A. FOOD AND DRUG BILL

SENATOR COPELAND has introduced a new food and drug Bill (S—5), but it is not yet known what the United States Congress will do in the way of legislation. This Bill is not to be regarded as an Administration measure, and a considerable amount of jockeying for position is taking place between business and the Government.

The Bill contains a definition of false advertising and gives a list of diseases patent medicines for which may not be advertised. Proprietary foods sold for special dietary uses are required to give information of their nutritional value, but all other foods and drugs are exempted from disclosing their ingredients. The Bill does not require a proprietary medicine to state whether it is a "cure" or merely a "palliative", and the Food and Drug Administration is not given authority to make "mass multiple seizures" of suspected products. The authority of the Secretary of Agriculture to promulgate new regulations is restricted, and this power is placed in the hands of two committees—one on public health and one food standards —to be appointed by the President. All regulations that may be adopted after the Bill becomes law are subject to court review.

The Bill does not provide for quality grading for foods, but merely states that the committee on food standards can formulate for any food "a definition and standard of identity and a reasonable standard of quality and fill of container". Fresh fruit and vegetables are exempted from even this minimum standard. There is a strong sentiment in favour of quality standards on the Consumers Advisory Board, but this has only a modest sphere of influence, and there do not appear to be signs in Washington of its being enlarged.

FOOD GROUP on the CONTINENT

OWING to the enterprise of the committee and officers of the Food Group of the Society of Chemical Industry the visit in the first week of June to the Continent, in which some thirty food chemists, accompanied by a few ladies, took part, was a pronounced success.

The visit was announced originally as being to some of the principal laboratories and research stations of Paris and Brussels, but by the time the programme came to maturity arrangements had been made to include several food factories.

Visits included the Heudebert Dietetic Products Factory, the Laboratoire Municipal de la Ville de Paris, the Institut d'Hygiène Alimentaire, and, most important of all, the Maison de la Chimie, all in Paris.

In Brussels the Willemans-Ceuppeus Brewery, the largest in Belgium, and the International Fair were inspected. A full report of the tour, with pictures, one of which is reproduced below, appeared in the *Food Industries Weekly* of June 14.

Members of the party about to start on a tour of the Heudebert Dietetic Products Factory in Paris.

Jam Troubles

By R. S. Potter, B.Sc., A.I.C.

IN A previous article which appeared in the May issue of this journal it was stated that most jam troubles could be traced to faulty boiling, but other factors such as the choice of fruit, cooling of the jam after pouring, etc., must also be taken into consideration. It will probably be more convenient to deal with the commoner faults separately and briefly to indicate how these arise and how they can best be overcome in practice.

Fermentation

Fermentation in jams and jellies is caused by the development of yeasts or degenerate moulds. It is, of course, well known that weak sugar solutions (up to a concentration of about 30 per cent.) ferment readily, but when the concentration is increased the susceptibility to fermentation is reduced, with the result that solutions containing above 70 per cent. of sugar will not ferment at all. This inhibition of yeast growth can be likened to preservation by desiccation: the sugar, having a very strong affinity for water, causes the amount of water available for the yeast cells to fall below the minimum required for development.

The acidity of the jam also has an effect upon the development of yeasts; the higher the acidity the less the probability of fermentation occurring. Therefore the less acid fruits, such as strawberries, should always be adjusted by the use of citric acid or tartaric acid.

In practice it has been found that if the soluble extract of jam is adjusted to 70 to 72 per cent. with a normal acidity of about 0·8 to 1·0 per cent. the risk from fermentation is very slight. With jams having a higher acidity than the above the soluble extract may be reduced to 68 to 70 per cent. without much fear of trouble.

Fermentation, being caused by micro-organisms, is, of course, dependent on either the initial presence of acid-resisting organisms (or their spores) or on their subsequent introduction into the jam during manufacture. Of the possible sources of infection, the most likely is the pulp or the fresh fruit. Both these should be above suspicion, since, although the fruit is subsequently boiled, the organisms are usually present in such large numbers in fermenting pulp and fruit that this boiling does not ensure complete sterilisation. Another source of infection is the sugar, but if good quality white sugar is used the risk is small. These two sources constitute the main points of infection of the jam prior to boiling, and if the degree of contamination is not excessive the boiling in the pan will produce a sterile jam when finished.

Infection of the jam after boiling is also an important point, since, although the temperature may be high, it may not be high enough to kill any yeasts or spores which may find access to it. The jars are a potential source of infection, and these should always be well washed before filling. Even if precautions are taken, however, to ensure almost sterile jars, there is always the danger of infection of the jam from micro-organisms which are ever present in the air and on the walls of the factory and the floors, and also on the tissues and closures. It is in this connection that factory cleanliness is of great importance.

Before leaving the subject of fermentation it should be mentioned that, although a recipe may be calculated to give a resultant soluble extract of 70 per cent. or above, it often happens in practice that the whole of the jam in a jar is not uniform. After setting, quite often a liquid exudes to the top or sides of the jam, and this liquid, while still containing a certain amount of dissolved sugar, is much weaker in extract than the main portion of the jam. This phenomenon is known as syneresis, and is particularly noticeable with strawberry jam, but is almost absent from bramble jelly. It is possible that fermentation is first set up in this weaker syrup, and it is significant that, taking the case of the above-mentioned jams again, the former is far more susceptible to fermentation than the latter. Sudden cooling is apt to cause syneresis of jams and jellies, and this should therefore be avoided.

Mould Growth

It has already been stated that moulds may, under unsatisfactory storage conditions, develop on jams which have been correctly made, and for this reason care should be taken to store jam in a suitable place. The ideal conditions for storage are low temperature—about 60° F. —and low atmospheric humidity. But even under these conditions jam may mould if incorrectly prepared, and the manufacturer can, to a large extent, guard against complaints of moulding by paying attention to factory control of boiling. Moulds are similar to yeasts as regards the effect which sugar has on them, the tendency to develop decreasing as the concentration of sugar increases, so that if the risk of mould growth is to be small the soluble extract should not be much less than 70 per cent. when the acidity is normal.

Infection with mould spores takes place almost solely from the air, and although it is true that jam immediately on leaving the boiling pan does not contain living mould spores, it is almost equally true to say that each jar of jam at the time of closing is infected to a greater or lesser degree with mould spores. For this reason jam

should be covered quickly and the filling and packing room should be kept as clean and hygienic as possible.

Assuming that the soluble extract is correct, there are two practical methods of avoiding trouble from moulds—viz., by using hermetically sealed tops and sterilising, or by using *freely* permeable closures such as parchment without sterilising. Half-way measures between these two are best avoided. The former is probably the best and surest way of dealing with the problem. Since the jam itself, apart from the surface, is sterile as regards mould spores, and if a perfect seal by a metal closure is obtained so as to prevent subsequent infection, it follows that if the surface of the jam, the headspace above it, and the underside of the cap are made sterile, then no moulds can develop, whatever the external conditions may be. This sterilisation may be done by filling the jars with jam at 190° to 200° F., closing immediately and then inverting the jars for about three to four minutes. Alternatively, it may be done by passing the jam through a steriliser heated by steam or other means, the main body of the jar being shielded from the heat by means of a screen.

It is not always possible, on account of cost, to close jam with metal tops, in which case probably the best alternative is to use tie-over parchment covers, which are freely permeable to the air and water vapour. When stored under dry atmospheric conditions, water vapour passes from the jam through the parchment and no condensation occurs. In humid weather water vapour may pass through the cover and be absorbed by the jam and cause moulding on account of the soluble extract in the surface layer becoming too low; but unless these humid conditions are maintained for lengthy periods, when dry conditions prevail the water vapour will again pass through the cover and no harm will result in the jam.

If closures are used which are only semi-permeable to air and water vapour, changes in atmospheric conditions may cause condensation of water on the underside of the cover or on the surface of the jam, and moulding may easily result.

Granulation

The subject of granulation is one which concerns not only the jam manufacturer, but also the packer of many other food products such as honey, sweets and other boiled goods, and many kinds of manufactured confectionery lines. The laws governing the granulation of sugar syrups have been studied in connection with these products, and experience has shown that, for practical purposes, jam may be considered as a sugar syrup as regards granulation.

There are two types of granulation which take place with jam—namely, sucrose (or cane sugar) crystallisation and dextrose (or glucose) crystallisation. The latter is the more common, but the former may take place on the surface of jams fairly soon after packing. The prevention of both these types of granulation depends on the maintenance of the correct balance of sucrose and glucose in the jam, and in short it may be said that, of the 70 per cent. of soluble solids in a jam, about 30 per cent. should be either glucose or invert sugar, and the remaining 40 per cent. should be sucrose. If these proportions are maintained approximately, granulation troubles may be eliminated.

There are several ways of attaining the correct amounts of these sugars, but before these are discussed it should be mentioned that when sucrose solutions are boiled with acids a change occurs—called inversion—by which the sucrose is converted into equal amounts of two sugars, glucose and lævulose; the mixture of these two sugars is termed invert sugar. From the foregoing it will be obvious that one method of arriving at the correct proportions of sucrose and invert sugar is by regulating the amount of inversion which takes place during boiling. This may be done in several ways—by adjusting the acidity of the jam by the addition of acids or sodium bicarbonate, by varying the time of boiling, or by alteration of the temperature to which the jam is boiled. Of these probably the best is a combination of the first two, but in any case the correct amounts can only be obtained if the adjustments are made in conjunction with frequent analyses of the finished jam. These analyses should always be made, if possible, on jam filled and cooled under factory conditions, as a certain amount of inversion takes place during cooling in the jars. If this cannot be done, due allowance should be made, otherwise serious errors may arise.

Another method of regulating the proportions of invert sugar to sucrose in jams is the actual addition of a previously prepared invert syrup; or sometimes glucose or corn syrup is used for the same purpose. The preparation of invert sugar syrup involves the boiling of a solution of cane sugar with hydrochloric acid for some time, then neutralising with sodium bicarbonate and filtering, but commercial glucose has the advantage of being easily purchasable in the form of a concentrated syrup. If the proportion of invert sugar to sucrose is regulated by the addition of an invert sugar syrup or commercial glucose, the corresponding amount of cane sugar must, of course, be omitted from the recipe, due allowance being made for the water in such syrups.

Whichever method of regulation is adopted, the importance of keeping the correct proportions of sucrose and invert sugar cannot be over-emphasised. If the percentage of the former is too high, sucrose granulation is likely to occur, while if there is too great a proportion of invert sugar, then dextrose granulation may become a source of trouble.

In addition to the sugars themselves, there are other factors which affect granulation of jams. For instance, crystallisation is much more likely to occur in jams which are not well set than in those which are firm. Also the temperature of storage is an important factor. If jam is stored at relatively high temperatures, evaporation of moisture will result and the concentration of solids at the surface of the jam will be increased. Such conditions favour the development of sucrose granulation, but on the other hand dextrose granulation is retarded by increase in storage temperature, owing to the increased solubility of this sugar at higher temperatures. Conversely, low temperatures encourage dextrose granulation, so that a mean storage temperature of about 60° F. should be aimed at for jam storage.

The MANUFACTURE *of* MALT EXTRACT

Part I.

By Thomas McLachlan, A.C.G.F.C., F.I.C.

IF ONE searches the literature for instructions on the manufacture of malt extract there appears to be very little published information which is of much use. The 1932 British Pharmacopœia states that Extract of Malt is prepared by the digestion of sound, malted grain with water at a suitable temperature, and by evaporation of the strained liquid under reduced pressure at a temperature not exceeding 55° C., until a viscous product is obtained. The United States Pharmacopœia recommends that the malt be infused with water at 60° C., and that the resulting liquor be concentrated at a temperature not exceeding 60° C. Extract of Malt of the U.S.P. also contains 10 per cent. of added glycerin. This recommendation has evidently been adopted because the method given in the U.S.P. IX was found to be unsatisfactory. The U.S.P. IX required malt extract to be prepared by mashing the crushed malt with an equal weight of water for six hours, then adding a further four times its weight of water and heating to 60° C. for one hour, before filtering the liquor and evaporating at a temperature not exceeding 60°. It is therefore surprising to find that the 1934 British Pharmaceutical Codex gives almost these identical directions for the preparation of malt extract. The B.P.C. informs us that it may be prepared by macerating the coarsely powdered malt with an equal weight of water for six hours, after which the marc is mixed with four times the original weight of water heated to 30° C., and the mass allowed to digest for an hour at a temperature not exceeding 55° C. It is then strained and pressed and the mixed liquids rapidly evaporated under reduced pressure, at a temperature not exceeding 55°, until a viscous product is obtained. This method might give quite a good textile extract with slight modification, but it would be a very awkward one to handle on the large scale, as malt will fairly easily take up about its own weight of water.

At one time it was considered sufficient to extract malt with water at any temperature up to the boiling point, strain off and evaporate on the water bath.

Special Requirements

From these prefatory notes it will be realised that there is a general belief that malt extract is a product which can be manufactured by quite simple processes. While it is appreciated that particular malts and definite types of water are required for special beers, many think that the extract can be made from that malt which is unsuitable for brewing purposes. Those who are accustomed to handling malt extracts appreciate, however, that there is a difference between those of different manufacturers and also that while one type may be suitable for pharmaceutical purposes it is useless for the bakehouse or the laundry. In the textile industry one requires an extract which possesses a very high diastatic activity, but it may be absolutely unpalatable to take by the mouth, while for pharmaceutical use one requires an attractive preparation which will provide ready formed sugars suitable for a person with a weak digestion. In the case of textile extracts it is more or less immaterial whether the extract is fermenting so long as the diastatic activity is present, but for food purposes the preparation must remain, for practical purposes, as if sterile. Moreover, if an extract possesses a considerable proportion of sugars combined with a high diastatic activity, it will tend to caramelise on keeping and will develop a burnt flavour, so that for food and pharmaceutical use, if the extract is to be taken as such, too high a diastatic activity is a disadvantage. Again, for food purposes one will notice that if an extract crystallises its whole nature appears to alter. From being what is described as a yellowish-brown, viscous liquid, it will become streaked with pale yellow lines or sometimes the crystals will appear to develop from particles and radiate therefrom, whilst the flavour will alter entirely, to my mind for the better.

Flooring Conditions

At the present time more malt extract is probably used for textile purposes and in the bakehouse or brewery than for pharmaceutical preparations, so that it may be assumed generally that extracts should possess high diastatic activity. Some manufacturers prefer to use a thin-skinned plump malt, while others prefer a hard steely grain, but, whichever type of grain is to be employed, more care is required in the malting process than is the case for brewers' malts. A brewer is mainly concerned with obtaining the maximum amount of extract from the original grain, so that he likes a short period of flooring at a comparatively warm temperature. The distiller, on the other hand, is not very concerned with the amount of extract which he gets out of his malt; he is chiefly anxious about the liquefying and,

almost more important from his point of view, the saccharifying properties of his malt, in order to convert the maximum amount of additional starch. According to the type of extract he is requiring, the extract manufacturer has to consider quantity of extract, flavour, and diastatic activity. It is therefore considered by many that barley for extract purposes should be floored at a slightly lower temperature than for brewing malt, but that the flooring process should be for a slightly longer period, say, two or three days. This will allow of a slightly longer growth of the rootlet or culm and will deprive the grain of slightly more nitrogen, while at the same time rendering soluble a higher percentage of the total nitrogen in the residual malt. It will also necessitate the malting of barley for extract purposes during the cooler part of the season in order to prevent undue rise of temperature on the floor. As the main object in the preparation of an extract is to obtain either a high diastatic activity or a pale colour, the green malt must be kilned at as low a temperature as possible, since a rise of a few degrees in the kiln may cause all the difference in the amount of diastase destroyed. It has to be remembered also that, during the manufacture of extract, the grain, wort and extract itself can never be submitted to such conditions as will tend to sterilise the final product; therefore, while the kilning has to be at a lower temperature, it must also be as rapid as possible. This can only be effected if the aeration in the kiln is very good.

It has just been mentioned that malt for extract manufacture must be prepared as free from micro-organisms as possible, and in this connection two points must be remembered. In the first place the barley should be well cleaned before malting in order to eliminate any broken or stripped grains or other impurities which will encourage the growth of moulds or torulæ. The second point is that the water should be changed not less than every ten hours during the steeping process preparatory to flooring.

Barleys

H. E. Dryden (*J. Oper. Brewers' Guild*, 1926, p. 63) has published some interesting figures on barleys from different sources and the malts obtained from them when malted under similar conditions, and I would recommend extract manufacturers to give these figures their serious consideration, so that they may obtain some idea of the best type of barley to employ in order to obtain an extract best suited to their purposes. For convenience I have converted these figures to a moisture-free basis, as otherwise figures on barleys and malts cannot be compared.

(By courtesy of the British Dia Malt Co.)

Interior of a Floor Malting.

TABLE I

BARLEY.	*Californian.* Per Cent.	*N.-W. African.* Per Cent.	*Ouchak.* Per Cent.	*Norfolk.* Per Cent.
Moisture	10·7	12·0	11·8	12·3
On moisture-free basis:				
Total nitrogen ...	1·82	1·64	1·70	1·46
Total soluble nitrogen	0·126	0·143	0·196	0·128
Soluble uncoagulable nitrogen	0·090	0·112	0·113	0·099
Matter soluble in cold water	5·78	6·58	6·71	5·31
Diastase	11	15	35	18
MALT.				
Moisture	2·0	2·0	2·0	2·0
On moisture-free basis:				
Total nitrogen ...	1·60	1·61	1·64	1·37
Total soluble nitrogen	0·394	0·348	0·463	0·451
Uncoagulable nitrogen	0·325	0·291	0·377	0·376
Matter soluble in cold water	18·1	15·6	18·5	20·6
Diastase	30	28	38	35
Extract per quarter ...	92 lb.	89 lb.	96 lb.	100 lb.
Uncoagulable nitrogen 100 lb extract ...	0·361	0·334	0·400	0·378

Dryden, of course, was examining the barleys and their resulting malts from the brewing point of view, and was therefore chiefly concerned with the uncoagulable portion of the nitrogen in the malt, seeing that the extract is eventually boiled in the copper and all uncoagulable proteins removed by subsequent filtration. The extract manufacturer does not, as a rule, boil his extract, but he may be interested in the emulsifying properties of the extract, and these factors are largely controlled by the nitrogenous constituents of the extract.

Speaking generally, it may be stated that under-developed malt is useless for extract manufacture, that rather over-developed malt will give a high extract in proportion to the weight of malt employed, but that, if high diastatic activity is desired, the malt must not be too well developed.

In order the better to illustrate the difference between a brewers' malt and a malt for extract purposes, the following figures may be quoted:

	Pale Ale Malt.	*Extract Malt.*
Diastatic activity	28°	143°
Ready formed sugars in extract	18·5 per cent.	17·3 per cent.

Cytase and Peptase

Although everyone is familiar with the action of diastase, two other enzymes present in the original barley and in the final malt are almost equally important. These are cytase and peptase. In the absence of cytase it would be impossible to develop the diastase in the grain, as this enzyme is responsible for breaking down the cell wall and cellular material, and it is usually believed that cytase is the first enzyme to spread from the germ and that this is followed by the peptase and diastase. For all practical purposes the action of the cytase is finished with the kilning of the malt, but it is occasionally utilised in processes such as in the preparation of malto-dextrins by diastatic hydrolysis. The peptase present in the malt is important, as it continues to act in the mash tun and may increase considerably the amount of soluble nitrogen in the final extract according to the conditions under which the mash is made. For extracts for food, pharmaceutical, or brewing purposes the amount of soluble nitrogen is important, as these form easily digestible food for man or yeast.

Nitrogen

In Table II figures are given to show the amount of nitrogen,, total, soluble and uncoagulable, present in the original barley and in the final malt, but for emulsification purposes it is more important to consider the percentage of uncoagulable nitrogen, or, probabiy more important still, the soluble proteose and peptone nitrogen in the malt. Although these can be modified in the mash tun, it is as well to examine one's malts to this end, and figures are therefore extended from Table I to show the percentages of uncoagulable nitrogen calculated on the original malt and as a percentage on the extract.

TABLE II

	Extract per Quarter.	*Soluble Uncoagulable.*	*Percentage Uncoagulable per 100 lb. Extract.*
Californian ...	90·0	0·319	0·354
N.-W. African ...	87·2	0·285	0·327
Ouchak	94·1	0·369	0·392
Norfolk	99·8	0·369	0·370

If one may assume that the nitrogen in the Californian malt is just sufficient for emulsification purposes, then the probability is that the North-West African extract would be difficult to emulsify, while the Ouchak and Norfolk would give very good emulsions. Of course there are other factors affecting emulsification besides the nitrogen bodies present—as, for instance, dextrin, but one should always bear the nitrogen in mind.

Water

The only other ingredient of the mash tun should be water, and just as this is important in brewing so it is a point which must not be overlooked in the manufacture of malt extract. Generally speaking, it has been found that a water which is suitable for brewing a pale ale is that which is most satisfactory for the preparation of malt extracts. It need hardly be stressed that the water must be, for all practical purposes, sterile, and free from poisonous metals and from iron.

The Food Group at Norwich

Dr. Lampitt, Chairman of the Food Group, talks things over with Mr. Pooley (Secretary) and Mr. Edwin Thompson (President) of the Society of Chemical Industry.

ON May 24 and 25 members of the Food Group of the Society of Chemical Industry paid a visit to Norwich as guests of Messrs. J. and J. Colman, Ltd. On Friday afternoon they were shown over the mustard and starch making departments of the Carrow Works, and some of the manufacturing problems peculiar to these industries were demonstrated.

Embarking for a trip on the Broads after the meeting on Saturday morning.

Professor Raistrick (extreme right) lines up his men for inspection.

Before the visit to the works, Mr. Edwin Thompson, J.P. (President of the Society of Chemical Industry), Dr. and Mrs. Lampitt, Professor and Mrs. Raistrick, Mr. and Mrs. McLellan (Chairman, Hon. Secretary, and Vice-Chairman respectively of the Food Group) were received at the Carrow Works by two of the Directors, Mr. Russell Colman (H.M. Lieutenant for Norfolk) and Mr. J. M. Barclay.

After the visit the Food Group was entertained through the courtesy of the Directors of Messrs. Colman, Ltd., to a private dinner, and this, again, was a great success. At this dinner the guests were honoured by the presence of Mr. Alan Colman and Mr. J. M. Barclay. One would also like to express the gratitude of the Food Group for the excellent cider provided by Messrs. Gaymers, Ltd., and for the delightful chocolates presented by Messrs. Caley, Ltd.

Thanks to the generosity of the Directors of Messrs. Colman, Ltd., this Norwich meeting was the happiest and most interesting of any meeting within our recollection. Needless to say, the welcome which was extended to the members of the Food Group by the firm's Directors was highly appreciated.

Mr. Bacharach in lively debate with Messrs. Anderson and McLellan. The visitors assembled in front of the Luncheon Club at the Carrow Works for the Saturday meeting.

SPECIAL SUGAR FOR THE CANNING OF FRUIT

To the Editor of FOOD MANUFACTURE.

SIR,

We have received inquiries relating to Clause 164, p. 58, of the Report of the United Kingdom Sugar Industry Inquiry Committee (Cmd. 4871). This clause mentions the fact that sugars from different sources "may appear identical and for ordinary commercial purposes may be completely interchangeable, but their effects in the manufacture of, for example, tinned goods, may be very different". Reference is then made to sugars "which encourage the generation of hydrogen in the tin", and to a "brochure" on this subject published from the Low Temperature Research Station, Cambridge.

Accounts of the researches carried out here on the relation of sugars to the corrosion of steel and tinplate by acid syrups will be found in the Annual Reports of the Food Investigation Board from 1928 to 1934 (the last is now in the press), and also in Food Investigation Special Report No. 40, "The Corrosion of the Tinplate Container by Food Products" (p. 55), but the results have not been collected together in a single publication. It may therefore be convenient to summarise them in the following paragraphs:

I. Certain sugars will accelerate the corrosion of cans by fruits of high acidity, like gooseberries, owing to the fact that they contain traces of sulphur compounds in the form of sulphur-dioxide ultra-marine, etc. The action of these compounds is somewhat complicated, however, because it varies greatly with the acidity of the canned product, but on the whole it is fairly safe to recommend that sugars for canning should not contain added ultra-marine.

II. Certain sugars contain substances which inhibit or retard the evolution of hydrogen from the surface of a metal in the presence of an acid, and also retard the formation of hydrogen-swells in canned fruit. These substances are particularly abundant in beet-molasses and the brown beet sugars (seconds and thirds). They are largely removed in refining, but even so most commercial beet sugars possess appreciable inhibiting properties as compared with chemically pure sugar.

III. In experiments carried out here a mixture consisting of three parts of a pure white sugar to one part of a brown beet-sugar was used. The resulting syrup was a pale straw colour, and had pronounced inhibiting properties. It did not affect adversely either the colour or the flavour of the English fruits ordinarily canned, although this is a point which might require watching. On the other hand, it caused a decided lag in the formation of hydrogen-swells as compared with syrup made from the pure white sugar alone.

The conclusion seems to be that, so long as corrosion remains a problem, a special sugar for canning might be made available. It should contain as much of the inhibiting substances as is consistent with maintaining unimpaired the quality and wholesomeness of the canned product. Such a sugar would appreciably help to reduce the losses due to hydrogen-swells with most of the fruits which normally give trouble.

Yours faithfully,

FRANKLIN KIDD,
Superintendent, Low Temperature Research Station.

FOOD IN HUNGARY

DR. GERALD DRUCE, writing of conditions in Hungary, says that agriculture is the chief occupation, and if conditions demanded still larger crops they could be raised on the fertile soil of the Great Plain. Irrigation schemes were begun along the valley of the Tisza in 1932. Flour milling is the dominant industry, and agricultural products supply most of the raw material for the country's limited chemical industry. Two million acres are under maize and yield two and a half million tons of corn annually. Considerable quantities of starch are prepared at Budapest. Sugar beet is being grown on an ever-increasing scale, and some 130,000 tons of refined sugar are made at the refineries at Szerencs, Mezöhegys, Szolnok, and Hatvan. The Budapest confectionery trade is also doing well, but vegetable preserves and jams have not yet become fashionable. A number of modern canning establishments exist and are extending their output. Among the specialities that appeal most to Hungarian consumers are canned cherries, apricots, and peaches. Another Hungarian food speciality is salami, prepared at Budapest, Debreczen, and Szeged. Tobacco, gall-nuts, saffron, madder, sumach, poppy and caraway seeds, and paprika are cultivated for special purposes and local consumption.

2,000 Years Ago

Mutton Suet*

GOATES, sheeps, & moreover Harts sewett, is thus to be prepared. Take ye fat of either of these, as is before sayd, & hauing washt it, as is formerly exprest (FOOD MANUFACTURE, March, 1935, p. 102) in ye preparation of that of swine, & pulled off the skinne from it, put it into a mortar to temper it, & beate it pouring in a little water vpon it, till nothing like blood comme from it, nor noe fatt swimme vpon it, and it becomme cleare. Then casting it into an earthen vessell, & adding vnto it as much water as may couer it ouer, put it ouer a gentle coale fire, & stirr it about. But when all is melted, hauing poured it into water and cooled it, and hauing washt ye vessell, melt it ye second tyme, and doe according to ye directions formerly set downe. Then hauing melted it the third tyme, without water, straine it out into a mortar moystned with water, and when cold lay it vp in store, as hath been sayd of that of swine.

* From *The Greek Herbal of Dioscorides* (translated into English in 1655).

Advertising

(Illustration by courtesy of Broome and Greene.)

Food Products

A Survey by B. C. Saville

I SHOULD like, first of all, to compliment Mr. H. E. Monk, B.Sc., F.I.C., on his thought-provoking contribution on the subject of food advertising published in this journal in February. Mr. Monk's well-reasoned case for a certain measure of control over the fertile imaginings of irresponsible copywriters is bound to meet with the approval of all who have the welfare of the food industry at heart.

Over-optimistic claims in advertising frequently mislead, because readers accept them at their face value without critical examination. Only a small percentage of the public can be relied upon to read with such discrimination as to protect themselves from statements tending to mislead, if not actually designed to deceive. This trick in expert writing has been developed to a fine art by a certain section of those who prepare advertising copy. Intellectual dishonesty, as well as a failure to control sincere enthusiasm, leads to exaggeration, absurd phraseology, and "copy" so worded that even the educated man may subconsciously read into it a meaning not actually there.

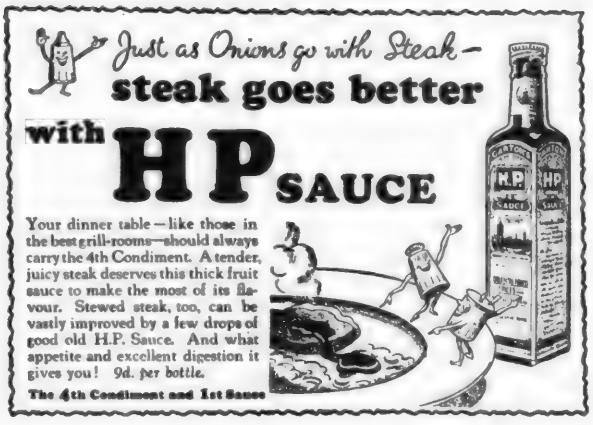
However, the way of the reformer is always hard, and I do not intend to deal with the ethics of the business here. It is enough that many people, of the same opinion as Mr. Monk, are valiantly playing their part, and that the Food Manufacturers' Federation has even gone so far as to give the matter its close attention, and to report that "progress in the standardisation and description of food will be seriously hampered" until the rights and wrongs of food advertising, from an ethical point of view, are dealt with.

To the impartial observer it would appear that stupidity is a far more prevalent vice among food advertisers than the mere tendency to mislead. This is a sad state of affairs when one considers the productive efficiency of the British food industry as a whole; for if the manufacturer, in co-operation with his advertising agent, were to take half the trouble in preparing copy that he and his chemist devote to the manufacture of the goods, the entire business of distribution would be rendered vastly more effective.

Appealing to the Appetite

What, then, is the true function of any food advertisement? Surely to inform the housewife, as briefly, attractively, and (one hopes) as truthfully as possible of the existence and special features of a particular brand, with a view to persuading her to purchase it. To do this she does not need to be told about such abstruse matters as vitamin content or calorific values, even if they are dealt with by a competent authority, much less if they are written in the usual unscientific distorted jargon of the copywriter. In plain fact the vast majority of the public, being far too ignorant to grasp the meaning of any sort of technical term, is inclined to pass over this type of advertising without paying it the slightest attention. After all, the much discussed man-in-the-street, in considering a beefsteak, looks not so much for vitamins as for the true steak flavour, and infinitely prefers the thought of its juicy succulence to a knowledge of its nutritive properties. Is it not obvious, therefore, that the proper line for food advertising to take is mainly in the direction of appeal to the appetite?

Food advertising, in my opinion, should be a very simple proposition, for the reason that everyone who writes copy has the "consumer's outlook" and should therefore be able to view the product through the eyes of every potential purchaser. Imagination is certainly required in the creating of an effective food advertisement, but above all it must be of the kind that is founded on fact and human experience, not the sort of inane fancy that goes soaring off into the blue. Strange as it would apparently seem to a large proportion of the advertising fraternity, the technique of successfully advertising a food product is vastly different from that required to give publicity to an expensive car or a bottle of perfume.


Just as Onions go with Steak—
steak goes better
with
H P SAUCE
Your dinner table—like those in the best grill-rooms—should always carry the 4th Condiment. A tender, juicy steak deserves this thick fruit sauce to make the most of its flavour. Stewed steak, too, can be vastly improved by a few drops of good old H.P. Sauce. And what appetite and excellent digestion it gives you! 9d. per bottle.
The 4th Condiment and 1st Sauce

Modern Tendencies

Take, as an excellent example of all that is praiseworthy, the posters and press matter issued by the makers of H.P. Sauce. These are essentially simple, at times humorous. The posters incorporate coloured illustrations of bacon, eggs, and sauce that, because of their quality of attractive realism, make a direct and bold appeal to the appetite. The newspaper announcements carry on the same tradition, with such forthright and readily assimilated statements as "Just as Onions go with Steak, Steak goes better with H.P. Sauce". Lea and Perrins are also to be congratulated upon their continual advocacy of their own brand of sauce as, among other things, a flavouring for soup.

Turning to soup advertising proper, we come upon what can probably be termed one of the most strikand successful poster campaigns of recent years — namely, the Eight Great Plates scheme, sponsored by Chef Products. This, of course, makes use of the "surprise" element—a very useful sales stimulus if sparingly and aptly employed. Readers may recall the preliminary announcement on the hoardings, consisting solely of the words: "Eight Great Plates". A month or so later, when sufficient time had elapsed for this to make a thorough impression, the illustrated version appeared, bearing also the name of the brand. Thus the makers firmly established the name and chief characteristics of their product in the minds of the public.

Campbell's Concentrated Soup campaign, in the national Press, is also worthy of commendation, in that it appeals to the thriftiness of the housewife as well as to the palate.

I cannot personally see much point in slogans like "I sell Quality" or "Oh, the joy of Blank's Soups". The first example suffers from a fault common to many advertisements and much bad verse—*i.e.*, it deals too pronouncedly in the abstract. A picture or short description of good, tasty, appetising soup is better than all the loose talk of Quality, High Standards of Excellence, and the like—mainly for the reason that it appeals to those brain cells which communicate directly with the stomach, rather than to the more highly developed section of the brain that is capable of considering philosophies and abstract entities. Incidentally, the word "joy" as employed in the second slogan is badly misapplied, joy being an emotional state too high-falutin' for use in connection with mere alimentary satisfaction.

An Individual Approach Wanted

The psychology of this sort of advertising is due, I think, not so much to the actual experience of eating good food as to copywriters' mental indigestion, resulting from a surfeit of motor-car, corset, petrol and a host of other advertisements. The only legitimate cure is for the copywriter to start afresh, study his own reactions to food, and then write his "copy" accordingly.

So delicious...
yet so seldom made at home
TAIL SOUP
All the world's in debt to England for her famous ox tail soup. If you have not tasted it recently, you will do a service to your own enjoyment in right good eating, by indulging in this richly satisfying soup, with its own distinctive and delicious flavor.
Campbell's chefs make it superbly. So you may dismiss from your mind any thought that it is barred from your table. It is difficult to make at home — but there's always Campbell's right at your elbow!
The appetite craves variety and "new things" in soup, as in everything else. And it will find exactly this novelty and pleasure in Campbell's Ox Tail Soup.
Meaty, marrowy ox tail joints in a sumptuous ox tail broth, liberally supplied with vegetables and barley, and delightfully flavored with fine sherry. Bring to this soup a keen appetite and a yearning for something exceptional. It deserves both—and it answers both!
21 kinds to choose from...
OX TAIL SOUP
by Campbell's famous chefs

To put the whole matter as briefly as possible, far too much food advertising at present might be any sort of advertising. That is why the press and poster announcements of C. & E. Morton, Ltd., deserve commendation. I definitely like the house slogan: "Morton make Good Things to Eat". This, coupled with the peculiarly encircled RT of Morton, immediately lifts these advertisements out of the rut.

Almost any housewife, glancing through the pages of a news-

paper, will be struck by the circular panel and bold phrases, but above all by the illustration, which shows at once that the product being advertised is *food*.

In advertising work, as in photography, one of the most important, and frequently one of the most difficult, tasks is to get the subject mentally in focus. The recent Bread campaign ("Other Foods cannot take the place of Bread for Energy") is, to my mind, an excellent example of unfocussed thought. It is a case of not seeing the trees for the wood, of diffusing energy recklessly over a wide area. After all, if one were to proceed on these lines, there would logically come a time when all food manufacturers would unite to shout at us from every hoarding: "You *Must* Eat."

The consumption of such a very stable commodity as bread is scarcely to be increased, I imagine, by such co-operative advertising. On the other hand, brown bread as opposed to white, and certainly Hovis as distinct from other brands of brown bread, is certain to gain from such pertinent copy as "Don't say Brown Bread—say Hovis—Best Bakers Bake it".

Before passing on to the advertising of canned goods, I would like to refer briefly to Lyons' witty Swiss Roll series, to the cleverly classified Bisto advertisements (Bisto Kids for the masses, Dickensian stories for the slightly more cultured classes), and to the originality of Mackintosh's in showing a simplified form of sugar-boiling pan being emptied of its luscious contents.

Canned Goods Neglected

As an outsider, so far as the actual manufacture of foodstuffs is concerned, it appears to me that the publicising of British canned goods is for the most part badly neglected. The sole exception to this rule would seem to be the Press advertising of Smedley's produce, which, though simple in essence, is extremely forceful and to the point. Whoever is responsible for these advertisements is to be congratulated. I have, however, one suggestion to offer: why is this campaign, and other similar ones, confined almost solely to peas and other vegetables? Surely there is a still wider field to be covered, in the future if not at present, by advertising British fruits (Kentish strawberries, Scottish raspberries, etc.) more extensively. The housewife, one must remember, still thinks of teatime canned packs in terms of imported pineapple, peaches, and apricots.

Apart from the obvious neglect, from an advertising man's standpoint, of canned goods, there is also room for improvement to be observed in regard to the publicising of (*a*) fish and meat pastes, (*b*) chocolate and confectionery generally, and (*c*) honey. The first of these groups has an extremely wide public, yet I feel sure that the sales of any good brand of such paste could be considerably augmented by a really imaginative and properly organised campaign.

Chocolate and confectionery should, in my opinion, be advertised less on the lines of "X is Good for the Nerves" as on deliciousness, appetite-provoking illustrations, and variety of filling, etc., available. Honey, one of the most appealing and valuable of natural foods, surely deserves a small campaign all to itself.

Before concluding I would like to commend the C.W.S. Tea advertising, which has succeeded in carrying on the famous old tea traditions in spite of the handicap of the rather long-winded name "English and Scottish Joint C.W.S." The same firm's booklet of Lutona Cocoa Recipes furnishes a further example of what can be done in colour printing, providing adequate care is taken in the way that the subjects are chosen and handled.

What, then, are the factors necessary to attain a higher standard of efficiency in the advertising of foodstuffs? In my opinion they may be summarised as—a better understanding of human psychology as applied to food consumption, a more lavish use of colour and illustrations in general, a clearer definition of purpose, and the employment of imagination in small doses, as opposed to a mere mechanical acceptance of ordinary advertising rules and technique. And, just because one firm makes a success of a certain method, there is no reason for supposing that a similar advertising formula will suffice for everybody else; the truth is quite the contrary, but a considerable amount of plagiarism, to the point of slavish copying of ideas, is to be seen at the present time in advertising, though not to any great extent as yet in the case of foodstuffs.

RATE OF HEAT TRANSFER

Its Significance in the Processing of Foods

By J. C. MARQUARDT

New York Agricultural Experimental Station, Geneva, New York

The following study is particularly interesting in view of the recently published Report No. 77 by the Ministry of Health on the Supervision of Milk Pasteurising Plants.

Mr. Marquardt has made a study of the heat transfer values of two materials commonly used in the construction of pasteurising vats. The heat transfer coefficients were correlated with metal, film, and milk temperatures as related to type and temperature of the heating medium and the rate of agitation.

Comparisons of the heat transfer coefficients were possible as the tests of the two materials were made under like conditions. It was found that the heat transfer coefficients covered a wide range when the materials were used under different conditions.

The facts established in this study are imperative for a proper understanding in the undertaking of future work which deals with the influence of treatment upon the pasteurised milk.

DURING THE past decade there has been considerable speculation concerning the influence of the temperature of the heating medium on the resulting product when milk or cream is pasteurised. It has been advocated that a very small range in temperature between the heating medium and the product heated should be used. The view has also been set forth that the range in temperature between the heating medium and the product has no significance in the pasteurisation of dairy products. Both views are presented from the point of affecting to a minimum the physical properties of the products heated.

These contentions, in accordance with the views of the author, call for laboratory findings to develop facts to support or deny their correctness. The literature contains no references to findings of this nature. It is for this reason that the following study was inaugurated. Before we can safely speculate on what can be accomplished in pasteurisation it is necessary actually to know what takes place as far as heat transfer is concerned.

The specific aim of this study was to establish physical constants for the rate of heat transfer through two substances used in the manufacture of pasteurising equipment. The influence of agitation of the product upon the value of the heat transfer constant, and its correlation to the temperature of the heating medium, were investigated. These values must be definitely established before further progress relative to the influence of heat upon the physical properties of milk or cream and other food products can be thoroughly understood.

Interesting deductions relating to the rate of heating and cooling water, milk, skim milk, and cream with hot water or steam were possible as a result of the data tabulated while the work was in progress.

Procedure

The first step in this project was to construct two pasteurisers. These were to be comparable in every respect except for the lining, which was to be made of two different substances used in the comparisons. Two 30-gal. pasteurisers insulated with 1 in. of cork and covered with galvanised iron were selected for this

FIG. 1.—Two pasteurisers constructed for the investigation, showing connections and apparatus used.

study.* The pasteurisers were jacketed in like manner; each jacket had a capacity of 30 gal. The jackets were constructed so as to allow steam pressures as high as 10 lb. to be developed in them. Each jacket was fitted with water, steam, and brine connections. An interchangeable pump with a capacity for circulating 60 lb. of water per minute was supplied so as to provide circulation within the jacket whenever it was desired. Thermometers were inserted in the jackets so that a record of the temperature of the in-going and out-going water, steam, or brine could be determined. Fig. 1 furnishes a reproduction of the installation to augment the written description given in the text.

The first pasteuriser was lined with Alleghany steel. This metal is referred to as KA2 stainless steel. The steel has a uniform thickness of $\frac{3}{32}$ in.

The second pasteuriser was lined with glass-lined steel. The steel was $\frac{1}{8}$ in. in thickness and was covered with three coats of enamel. Both tanks had a heating area of 14·9 sq. ft. Each pasteuriser was equipped with a vertical three-blade propeller agitator. This agitator extended down the side of the wall, 5 in. from the bottom of the tank. Each agitator was supported at the bottom end of a 1 in. shaft. Each agitator was adjustable to four pulleys which allowed agitation rates of 56, 110, 172, and 218 r.p.m. The diameters of the pasteurisers were 20 in. This rather detailed description is included herein so that all points of comparison which follow can be checked and visualised by the reader.

The rate of overflow during the cooling process was 60 lb. of water per minute.

Before the actual tests were made thermocouples were placed in the vats. These enabled the invstigators to record the temperatures of the walls of the pasteurisers during the heating and cooling process. Likewise thermocouples were inserted so that the temperature of the milk film $\frac{1}{16}$ in. from the wall could be recorded. Each temperature desired was obtainable in duplicate because of two thermocouple installations for each condition studied. Three thermometers were placed across the vat so as to record the temperature of the milk at three locations in the vat. Charts were arranged so that temperature recordings were possible at 2·5 minute intervals.

Milk, skim milk, cream, and water were heated in both vats with water at 210° F., and with flowing steam. For each product heated and cooled, each speed of agitation available was employed. The cooling in all cases was done with water at 67° to 68° F., which flowed through the jacket at a rate of 60 lb. per minute.

After sufficient observations had been made to warrant deductions, the results were summarised, represented graphically, and the physical constants for the two pasteuriser walls calculated for all conditions investigated.

Results

More than 5,000 temperatures were recorded during these trials. Since these recordings were in a regular continuous series it immediately became apparent that countless numbers of separate series could be presented. However, the direct aim of the investigation was to present tabulations of interest rather than numerous series of doubtful importance.

The first step was to present in bar diagram form the results obtainable when heating milk, water, skim milk, or cream for a period of 15 minutes with water in the jacket at 210° F. in the steel-lined and the glass-lined vat. Figs. 2 and 3 include all of the series summarised that deal with this part of the investigation.

Fig. 2 reveals that skim milk or water require approximately the same time of heating to arrive at a given temperature. Milk heats slightly slower than water or skim milk. Cream requires a longer time of heating to attain a given temperature than is required in the case of milk. The rate of heating is accelerated with an increase in agitation. Beyond a certain point, however, the increased rate of agitation tends slightly to decrease the temperature obtained in a given period.

Fig. 3 indicates that results obtained with the steel-

* Indebtedness is due to the Pfaudler Company of Rochester, N.Y., for the construction of these pasteurisers.

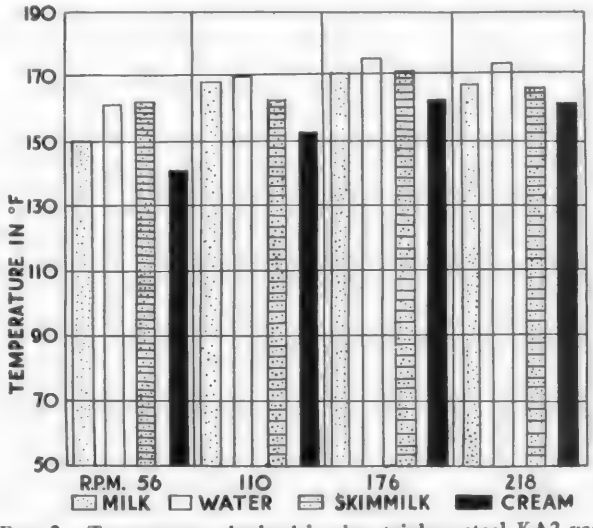


FIG. 2.—Temperature obtained in the stainless steel KA2 vat after a heating period of 15 minutes with water at 210° F.

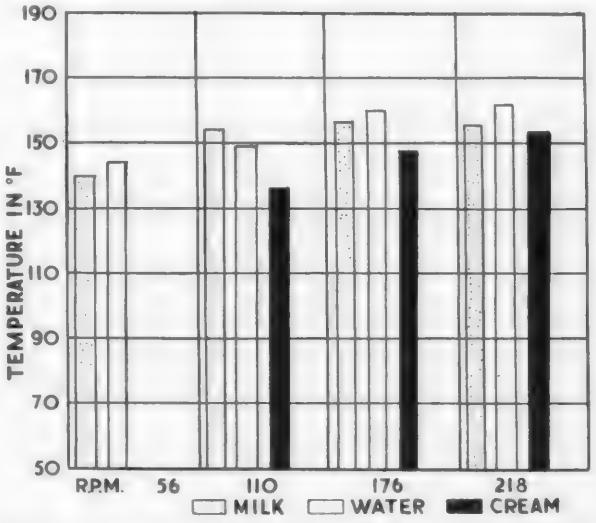


FIG. 3.—Temperature obtained in the glass-coated steel vat after a heating period of 15 minutes with water at 210° F.

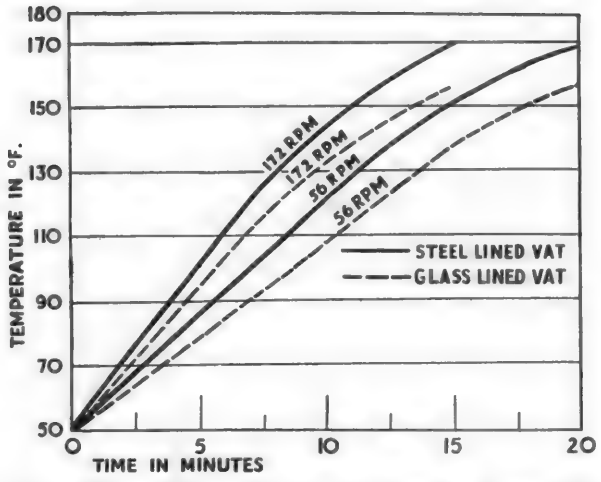


FIG. 4.—Effect of heating in steel- and glass-lined vessel with different rates of agitation.

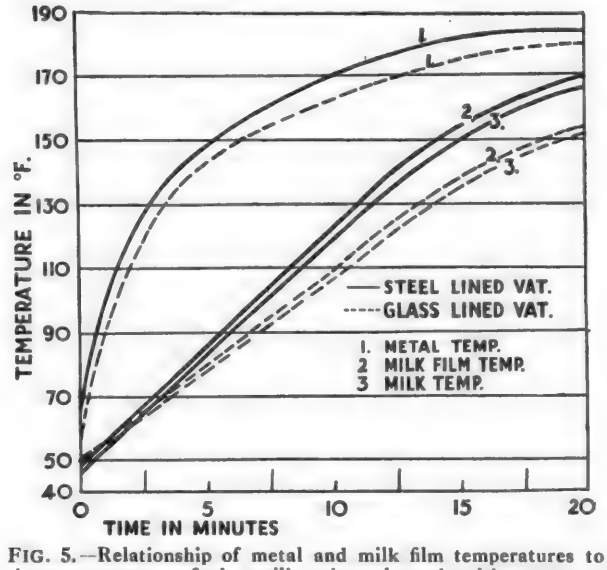


FIG. 5.—Relationship of metal and milk film temperatures to the temperature of the milk when heated with water at 210° F. and the agitator revolving at 56 r.p.m.

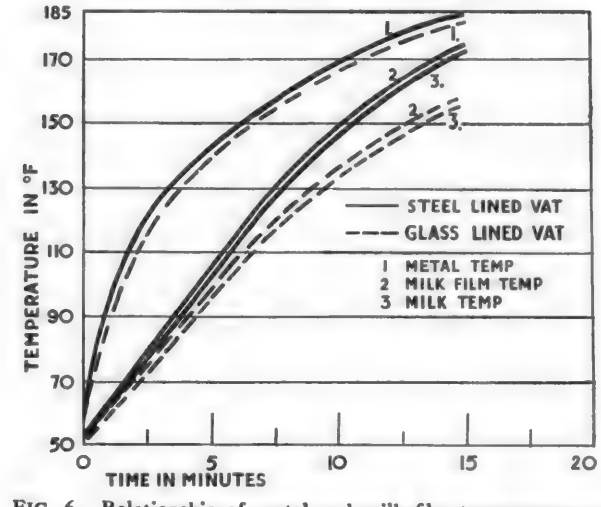


FIG. 6.—Relationship of metal and milk film temperatures to the temperature of the milk when heated with water at 210° F. and the agitator revolving at 172 r.p.m.

lined vat are also obtained in the glass-lined vat. The variations in trends, however, are less pronounced in the glass-lined vat than in the steel-lined vat. The reasons for these differences will become apparent as the heat transfer values are projected into this manuscript.

Since the bar diagrams indicate a uniformity in trends for the heating of milk, water, skim milk, and cream, it became apparent that the values obtained with milk could be developed to show the trend for all products. Milk was also selected as it is more commonly heat treated in the vats studied than are the other products. Because of a lack of marked variations received in using the four speeds, only two speeds were presented to show trends as related to speed of agitation.

In Fig. 4 are presented the temperatures obtained in heating milk with water at 210° F. The curves show that increasing the agitator from 56 to 172 r.p.m. increased the rate of heating. The curves show, further, that heating was more rapid in the steel-lined vat than in the glass-lined vat. At the higher speed the milk was heated to 170° F. in 15 minutes in the steel vat; whereas a temperature of the milk of only 155° F. was obtained in the same period of time when the heating was in the glass-lined vat. The curves show further that approximately 5 minutes of additional heating are required to obtain temperatures with agitation at 56 r.p.m. comparable to those obtained with the agitation at 172 r.p.m.

The curves presented in Figs. 5 and 6 show that for a slow or high speed of agitation the temperature of the milk is within a few degrees of the temperature of the milk film, a film $\frac{1}{32}$ in. from the metal. The curves show further that the temperatures of the metal or glass are in close range of each other at either speed. It is further shown for a 20-minute heating period with water at 210° F. that the metal or glass lining ranges from 14° to 25° F. below the temperature of the heating water.

In comparing Figs. 5 and 6 it becomes apparent that increasing the speed of agitation within the limits presented tends to decrease the range in temperature between the metal or glass lining and the milk. A study of Figs. 5 and 6 will reveal the point that in using water at 210° F. for heating, the development of excessively high temperatures at the point of contact between the milk and surface is not possible at a low or high speed of agitation.

An endeavour was made to study the rate of cooling in both vats with various speeds of agitation. In Fig. 7 are recorded the degrees drop in temperature which were obtained when cooling with water at 67° F. for a period of 30 minutes. In both vats the flow of water through the jacket was at the rate of 60 lb. per minute. Observations presented in the figure are based on cooling tests starting with the milk or cream at 165° F. It is noteworthy that the steel-lined vat enabled a cooling of about 20° F. lower than the glass-lined vat during the 30-minute period.

The same trends in cooling were observed as those noted in the heating trials. With the glass-lined vat cooling was accelerated with milk when the agitator speed was increased from 56 to 172 r.p.m.; and from

this point there was a very slight but positive decrease in the cooling rate. The cream, because of its greater solid content and viscosity, did not follow this same order, since the rate of cooling was increased with the rate of agitation.

The cooling rates for the milk and cream in the glass-lined vat change but slightly with increased agitation. The same trends were observed for milk and cream. The explanation is offered that during the 30-minute period, because of a slower rate of heat transfer, there was a tendency to approach a constant value in cooling. For this reason it became apparent that an interpretation of the data recorded required a more detailed presentation of cooling rates to more and shorter periods of time. Trends, however, have been established by the presentation offered in Fig. 7.

A more detailed study of the cooling is presented in Fig. 8. Here again the milk series and the speeds of 56 and 172 r.p.m. are selected. Again it was established that the heat transfer was slower through the glass lining than through the steel lining. It was also shown that the increased agitation increased the cooling rate.

The 30-minute cooling periods did not develop a 20° F. temperature differential between the cooling water and the milk. For this reason the curves presented in Fig. 8 tended to establish straight lines that showed a tendency to curve slightly as the 30-minute cooling period ended. For this reason a further presentation was required for cases that exceeded the 30-minute period in cooling time.

The cooling time extensions shown in Fig. 9 indicate that the cooling rate is naturally reduced when the time is extended beyond 30 minutes. This condition exists as the temperature differential between the 67° F. water and the milk is reduced to less than 25° F. after 30 minutes of cooling. The curves drawn in Fig. 9 are taken from individual runs. They verify the previously plotted curves which represent mean values of three or more trials. This indicates further the reliability of the data supporting the previously discussed points.

When milk is heated with flowing steam the milk temperature and the milk film temperature are always within a range of 3° of each other, a condition comparable to that obtained when heating with warm water. The relationships with flowing steam heating are presented in Fig. 10. In a general way the curves obtained with the hot water and flowing steam heating follow similar trends. Unfortunately, data were only secured with the glass-lined vat. Subsequent investigations made it imperative not to utilise the steel-lined vat under conditions which might cause slight steam pressures. However, a final investigation will establish the correlation between the two types of metal when heated with live steam without and under pressure.

It must be noted that in heating with steam the ingoing temperature was 213° F., and the out-going steam temperature was practically the same from the start to the finish of the heating period. This means that heat units were being supplied to the metal at a rate far above its capacity to transfer. In using hot water at 210° F. for heating the out-going water ranged at the beginning

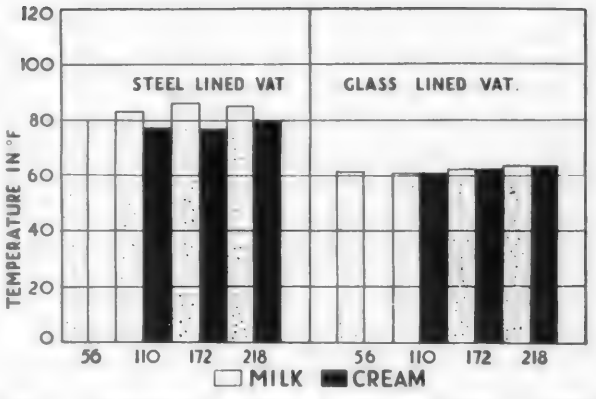


FIG. 7.—Temperature reduction in both vats after a cooling period of 30 minutes with water at 67° F.

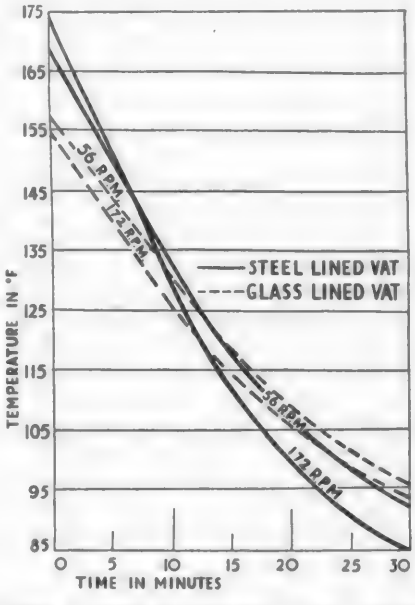


FIG. 8.—Effect of speed of agitation on the cooling of milk, using water at 67° F.

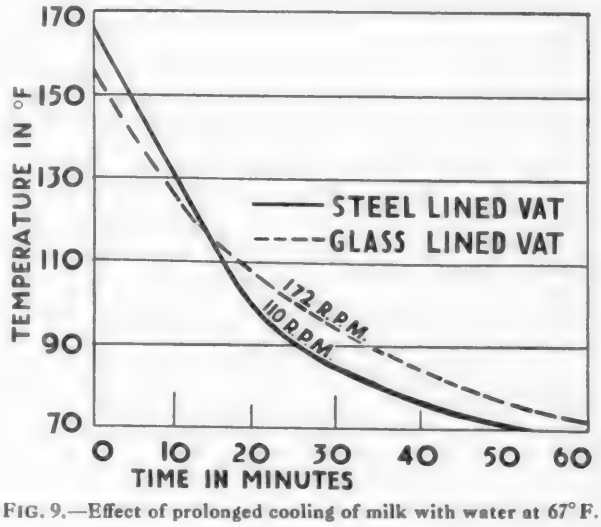


FIG. 9.—Effect of prolonged cooling of milk with water at 67° F.

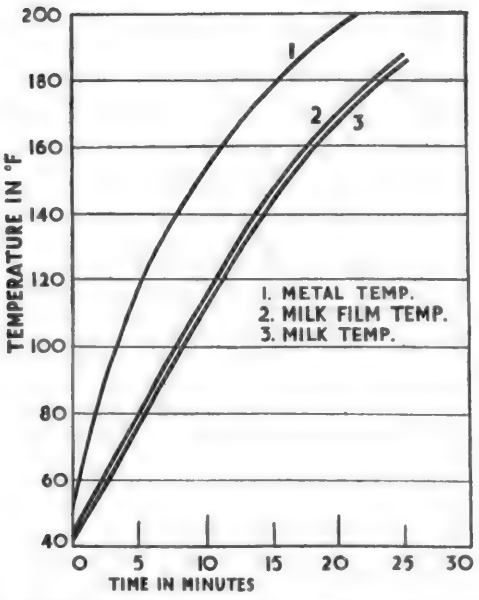


FIG. 10.—Relationship of metal and milk film temperatures to the temperature of the milk when heated with flowing steam and using a speed of 110 r.p.m. in the glass-lined vat.

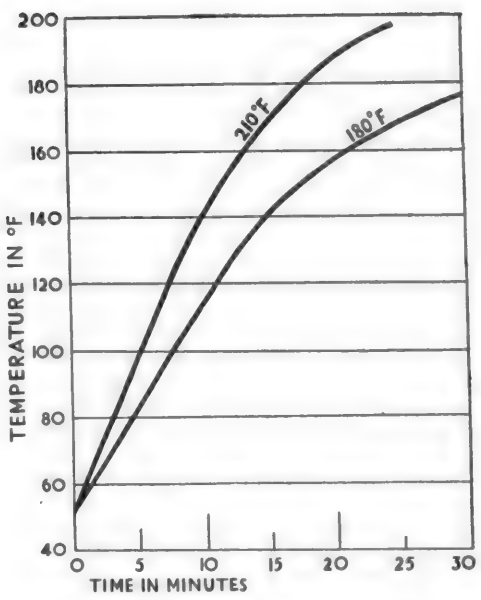


FIG. 11.—Effect of heating with water at 180° F. and 210° F. for 30 minutes with agitator revolving at 110 r.p.m.

from 156° to 165° F., and at the end of the 15-minute period from 195° to 197° F. This indicated either a greater heat unit transfer for water than for steam, or it merely indicated that the steam was being supplied at a rate far in excess of the capacity of the metal to transfer. Subsequent calculations of heat transfer constants will add further knowledge to this point.

Before calculating the heat transfer values it became apparent that a series with heating water at 180° F. should be run to compare with the series using heating water at 210° F. The results are presented in Fig. 11. These curves demonstrate what would be considered the conventional occurrence—namely, that the curve is more pronounced for the 180° F. series than for the series using 210° F. water for heating between the 15- to 30-minute heating period. This is true as the minimum temperature differential is approached in a shorter period of time when the lower temperature heating water is used.

Coefficient of Heat Transfer

Computations of the over-all coefficient of heat transfer were made for both materials of construction. In determining the coefficients, the following general equation was used solving for the value U:

$$Q = UA\Delta t_m$$

in which Q = total heat transferred in B.T.U. per hour
U = over-all heat transfer coefficient, B.T.U./sq. ft./hr. °F.
A = effective heating surface in square feet
Δt_m = logarithmic mean temperature difference

and where $\Delta t_m = \dfrac{\Delta t_1 - \Delta t_2}{2{\cdot}301 \text{ Log.} \left(\frac{t_1}{t_2}\right)}$

Δt_1 = temperature difference at one end
Δt_2 = temperature difference at the other end, the values so chosen that
Δt_1 is the greater.

The values for U were determined from the experimental data for each product heated or cooled in the equipment over the available range of agitation.

In general, the heat transfer coefficient definitely increased with an increase in the speed of agitation, which is in accordance with the usual findings on this subject.

There were some cases where there was no actual gain, but rather a loss, between two rates of agitation as noted with speeds of 172 and 218 r.p.m. As these isolated cases do not follow the general trend, we believe that the difference is a result of current baffling caused by increased speed of the propeller. This subject will require additional study.

Table I is presented, which allows a comparison of the average values for the observed over-all coefficient of heat transfer for both glass-lined steel and 18-8 alloy steel. The data presented in this table were obtained by taking the arithmetic mean of the values for 110, 172, and 218 r.p.m., neglecting the speed of 56 r.p.m. which is considered impractical for the dairy products used in these experiments.

The values in Table I show a general concurrency with the data presented in graphic form with respect to the fact that the 18-8 alloy steel conducts the heat somewhat faster than the glass-lined steel. The coefficient of heat transfer for heating milk in the glass-lined pasteuriser varied from 70·1 to 75·1 at speeds of agitation of practical application, while the values for stainless steel varied from 85·3 to 97·9. The average coefficients were 73·2 and 91·7 respectively. The rate of heating with the glass-lined pasteuriser with flowing steam trapped by a bend in the exhaust pipe was not quite as rapid as with water at 210° F., thus indicating that there is no more danger of burning milk with steam in this equipment than with boiling water. Lower values were secured for cooling due to the smaller temperature differential between the cooling medium and the milk. These values for cooling in the glass-lined pasteuriser varied from

48·3 to 53·8 and averaged 51·3; for the steel-lined vat from 69·3 to 75·8 with an average of 72·2.

TABLE I.—COMPARISON OF THE AVERAGE VALUES FOR THE OBSERVED OVER-ALL COEFFICIENT OF HEAT TRANSFER FOR GLASS-LINED AND 18-8 ALLOY STEEL EQUIPMENT.*

Product Heated or Cooled.	*Glass-lined Steel Equipment.*		*18-8 Alloy Steel Equipment.*		*Type of Heating or Cooling Medium Used.*
	Heating.	*Cooling.*	*Heating.*	*Cooling.*	
Water ...	79·9		107·4		Circulating hot water
	73·9		—	—	Steam at 0 pressure
	—	57·5	—	78·6	Circulating cold water
Skim milk	73·1		100·2		Circulating hot water
	—			77·8	Circulating cold water
Whole milk	73·2		91·7	—	Circulating hot water
	—	51·3	—	72·2	Circulating cold water
Sweet cream	63·3		73·8	—	Circulating hot water
	—	59·3	—	70·0	Circulating cold water

The only available published information on heat transfer coefficients for glass-lined steel seems to be Poste's† admirable collection of data which were obtained from commercial equipment of various sizes. Poste gave values for U varying from 70 to 148, depending upon agitation, temperature of heating medium, and tank construction. The larger values were obtained on vats with one layer of thin enamel. With thicker enamel produced by one layer of dry process he reported a value of 72, which is in good agreement with the results reported here. Poste also noted decreased cooling coefficients when the propeller was revolved above 190 in a pasteuriser 30 in. in diameter.

Because 18-8 alloy steels have only been in extended use in the dairy industry for the past five years, a similar comparison with commercial installations cannot be made at this time because of the scant information available. The authors feel that the values obtained for the alloy steel equipment may be used for practical purposes because of the close agreement of the large number of tests conducted.

However, it should be borne in mind that there are many factors which influence the rate of heat transfer in dairy equipment of this type. Among the most prominent we mention the size, shape, and speed of the agitators; the quantity, velocity, and flow of the heating or cooling medium through the jacket; and the type and temperature of heating medium used. For example, when the 18-8 alloy steel is used to line a vat of different design, a different heat transfer coefficient may be obtained for that specific case. To illustrate, the heat transfer coefficient was computed to be 181 B.T.U./sq. ft./hr./° F. from experimental tests on a 125-gal. vat in heating milk from 50° to 145°, using an ejector for circulating the heating water at 180° F. The higher value was due to a larger circulating volume of the heating medium. The ejector circulated 36 gal. of water per minute, whereas the pump used on the experimental vats circulated only 6·7 gal. of water per minute. The difference is greater than it appears to be, for in the former case all of the heating water contacts with the lining, while in the latter case only a portion of the heating water touches the lining. This fact is emphasised when it is considered that the experimental vats had a 50 per cent. greater heating area in proportion to capacity than the 125-gal. commercial vat. In the 125-gal. vat the heating surface was 34·2 sq. ft., or 1 sq. ft. of heating surface per 3·8 gal. capacity. In the experimental vats used in the project the heating surface was 14·9 sq. ft., or 1 sq. ft. of heating surface per 2 gal. capacity.

* Approximate heating range 40° to 180° F. Approximate cooling range 180° to 80° F.

† Poste, Emerson P., "Heat Transfer in Enamel-lined Apparatus," *Ind. and Eng. Chem.*, 16, 469, 1924.

Summary

Heat transfer was more rapid through 18-8 alloy steel than through glass-lined steel when used as linings for vat pasteurisers. When water at 210° F. was used to heat milk, the coefficient of heat transfer for the steel was 91·7 and for glass-lined steel 73·2. These values were secured upon special experimental equipment and would vary, depending upon the thickness of the steel, the thickness of the glass enamel, temperature differentials, rate of agitation, etc.

Increasing the speed of the propeller agitator increased the heat transfer up to a certain speed, above which there was no increase but an actual decrease. This peculiarity was thought to be due partially to no increased agitation in spite of more rapid movement of the agitator.

Water, skim milk, milk, and cream decrease the rate of heat transfer in the order given. The coefficient of heat transfer for water heated in 18-8 alloy steel was 15·7 greater than for milk, while in glass-lined steel the difference was 6·7. It is evident that water may be substituted for milk in testing pasteurisers for heat transfer if an allowance of approximately 10 to 20 per cent. is made, depending upon the rate of heat transfer. The coefficient of heat transfer for cream was 17·9 less than for milk in 18-8 alloy steel and 9·9 less in glass-lined steel.

The temperature of the film of milk within $\frac{1}{32}$ in. of the metal was usually within 3° F. of the temperature of the milk, even though the metal was 20° to 40° hotter than the milk and the heating water was 210° F. Increased agitation slightly decreased the spread in temperature between the milk film and the milk. Since the use of flowing steam as the heating medium did not increase the rate of heating, it is evident that flowing steam would not produce a hotter metal lining than did boiling water.

The rate of transfer of heat through a given metal varies markedly with the conditions under which the tests are conducted. For example, a coefficient of heat transfer of 181 was secured for 18-8 alloy steel in a vat of a different design.

(*Continued on page* 248.)

AMERICAN CHEMICAL SOCIETY AND FOOD MANUFACTURE

THE DIVISION of Agricultural and Food Chemistry was very much in evidence at the meeting of the American Chemical Society held in New York from April 22 to 26 last. The section held a joint meeting with the Division of Colloid Chemistry, when a number of important papers on the chemistry of starch were presented. This took place on April 25.

Canned Peas

Z. I. Kertesz presented a study on "The Chemical Determination of the Quality of Canned Peas", of which the following is the official abstract: During the season of 1934 a comprehensive study was made of the applicability of chemical determinations of the quality of canned peas and to predict the quality of the canned product from the raw material. Several hundred green pea samples, representing three varieties and three localities in New York State, were analysed before canning and after canning and three months' storage. In the peas, the total solids, water-insoluble solids, and alcohol-insoluble solids were determined and the result compared with the quality of the product as determined by scoring. In starchy vegetables the maturity of the product determined to a great extent the quality of the canned product. It appeared from the present study that the proportion of alcohol-insoluble solids, which includes starch, dextrin, hemicelluloses, proteins, and fibre, is a good index of the maturity and quality of canned peas. It is more sensitive to the changes in composition during growth than the proportion of the total and water-insoluble solids, both of which were recommended for quality determinations. On the basis of this study (mostly representing the conditions in New York State), the ranges for different grades are:

Less than 14·5 per cent. alcohol-insoluble solids	Fancy
14·5-20 per cent. " " "	Extra standard
20·0-23 " " " " "	Standard
Over 23 " " " " "	Substandard

For the 250 samples analysed the grades as determined by the alcohol-insoluble solids using the above limits showed but little variation from the grades obtained by the regular scoring methods.

Flake Coffee

R. B. McKinnis described "Flake Coffee: A New Form of Roasted Coffee". Freshly roasted coffee contained up to 5 vols. of retained carbon dioxide, the gradual escape of which rendered hermetical packing difficult as well as loss of considerable aroma. The fresh roasted coffee was subjected to heavy roller pressure, which expelled some 90 per cent. of the CO_2 and little loss of aroma. The thickness of the flake was of the order of five to six thousandths of an inch. Better extraction was obtained and about two-thirds only of the usual amount of coffee for a brew was necessary. It was particularly useful for preparation of iced coffee. New and more efficient machines for preserving coffee by means of high vacuo and pure CO_2 have been developed.

Rancidity

Coloured transparent cellulose wrappings for food was the subject of a paper by W. L. Morgan. It was pointed out that blue and invisible ultra-violet light accelerated rancidity in potato chips, cakes, butter, etc., whereas other visible light, such as red and yellow, had little effect. A highly protective yellow transparent cellulose film had been developed and used in food packing for about a year.

Asparagus Butts

Lloyd A. Hall discussed the utilisation of asparagus butts. This formed some 25 per cent. of the total asparagus and was looked upon as useless. It was found that this could be sliced, dehydrated, and powdered to give a good edible product with the same flavour, food value, etc., as the fresh asparagus.

C. H. Bailey and R. C. Sherwood dealt with the "Biochemistry of Bread-Making", in which the action of various organisms and enzymes was discussed.

RATE OF HEAT TRANSFER

(Continued from page 247)

Conclusions

1. Alleghany stainless steel and glass-lined steel are suitable materials for lining pasteurisers used in the dairy industry.

2. The heat transfer is more rapid through stainless steel than through glass-lined steel.

3. Milk, skim milk, and water react to temperature changes in a comparable manner. Their heating rates approach a constant value so that values obtainable with one of the liquids can be used for either of the other liquids. Cream reacts to temperature conditions slower than these liquids.

4. Increasing agitation increases heating rates up to a certain speed beyond which there is a very small but positive decrease in the heating rate.

5. The temperature of the milk film is only a few degrees higher than the temperature of the mixed milk when heating with water at 210° F. This condition is true for both types of metal.

6. In heating milk or cream to 150° F. with water at 210° F. the temperature of the film at the metal surface does not approach a temperature that would tend to impart to milk or cream a cooked condition associated with high temperatures.

7. Heating milk or cream with flowing steam produces results comparable to those obtained with water at 210° F. used as a heating medium.

8. In the utilisation of flowing steam for heating there appears to be a waste of heat units due to the inability of the metal to transfer heat at a rate equal to the speed at which the steam-supplying heat units enter the heating jacket.

9. The results obtained in cooling trials were in accord with the heating trials for the heat transfer values obtained under comparable treatments.

BOOK REVIEWS

Cereal Laboratory Methods

American Association of Cereal Chemists

THIS important compilation of methods for cereal laboratories has developed from a publication of a number of laboratory methods by the American Association of Cereal Chemists in 1922. In 1928 this work was completely revised by the Committee of Methods of Analysis and edited by D. A. Coleman under the title *Methods for the Analysis of Cereals and Cereal Products*. This somewhat cumbersome designation has now been condensed to *Cereal Laboratory Methods* in the third edition just published by the Committee of Methods under the direction of C. E. Mangels.

The 1928 edition has been in constant use in the reviewer's laboratories since its publication, and the methods given, together with the lists of selected references and tables of reference, have proved of great value. The present volume contains additional material, and the arrangement has been altered and improved. The original lay-out was rather clumsy and there was considerable overlapping. The sequence of wheat, wheat flour, feeding stuffs, bread, alimentary pastes, and enzymic determinations has given place to the more logical arrangement of—

1. Wheat and other whole grains.
2. Feeds and feeding stuffs.
3. Wheat flour, semolina, and similar products.
4. Enzymatic, physico-chemical, and miscellaneous methods.
5. Baking tests.
6. Baked cereal products.
7. Macaroni products.
8. Fats and shortening materials.
9. Leavening agents.
10. Yeast foods and flour improvers.

There is also an appendix containing many valuable tables. It can be seen from the above that the present volume is a big improvement on its predecessor—good though that was. In this work are included the methods of the Association of Official Agricultural Chemists and the Fat Analysis Committee of the American Oil Chemists' Society.

There has been a tendency to regard Cereal Chemistry as essentially the chemistry of wheat and bread. It has, however, a much wider field, and the inclusion of such subjects as stain in oats, acidity of corn, macaroni products, fats, and shortening materials is a valuable feature of the book. The chapter on fats and shortening materials is very complete, and the method given for the determination of shortening values with the shortometer is interesting. It is based on the work of C. H. Bailey, published in *Cereal Chemistry* only last year, and this is an indication of the up-to-dateness of the book. The method is essentially a mechanical means for determining the breaking strength of biscuits and should prove useful to those interested in biscuit manufacture. It is interesting to note that the Cinderella of the baking industry—cake and pastry making—has received her share of attention in this edition. This important section of the industry is dealt with under such headings as Cake Flour, Biscuit Test for Self-Raising Flour, Pie Flour Testing. Then there is a whole chapter on leavening agents, and, of course, the chapter on shortening is valuable in this connection.

Any criticisms that can be made are based on the differences between American and our own practice. Thus, for determination of moisture in wheat the chief method given is the Brown-Duval method. This is seldom used in actual practice in this country, where the hot-air oven is nearly always employed. As this is not a book of official methods, but methods in general use in cereal laboratories, one feels that some reference to the rapid electrical moisture testers, such as the Hielan D.K. or Burton Pitt testers, could have been made with advantage. Another slight disadvantage to chemists working in this country is the reference to the U.S.D.A. Bulletins, as these are not readily available over here. Thus the test for bushel weight starts with, "Apparatus described in U.S.D.A. Bulletin 472", and again, in the directions for the Brown-Duval method the dimensions and capacity of the flasks "should conform to the specifications in U.S.D.A. Bulletin 1375 Revised". It would have been an advantage if these had been printed in full in the present book, either in the text or as an appendix.

In addition to 129 pages of methods and references, there are about 70 pages of tables, including a very useful conversion table, one for converting ash content to a 15 per cent. moisture base and another for the same purpose in regard to protein and water absorption. The book is very well indexed, clearly printed on good paper. It should find its way into every laboratory dealing with any cereals or cereal products, but its sphere of utility does not end there. It would prove useful in any organic chemical laboratory.

T. H. F.

★ ★ ★

A History of Food Adulteration and Analysis

THIS little book written by Dr. F. A. Filby contains much interesting matter relative to the adulteration of food and beverages practised from time immemorial. The author has evidently searched long and diligently in the dusty archives of the literature on this subject and has unearthed some hair-raising and awe-inspiring methods of sophistication once prevalent, now, fortunately, owing to the efforts of the public analyst, almost extinct. Dr. Filby decided to deal with his subject in definite groups, and in turn he has described the frauds of the grocers, the bakers, the brewers, the vintners, and the distillers—and what a tale he does unfold!

The reviewer does not intend to spoil the reader's pleasure by giving away the plot, but to whet the appetite

(*Continued on next page.*)

REFRIGERATION IN THE WINE INDUSTRY

REFRIGERATION IS employed in two different ways in the wine industry: the viticulturist makes use of refrigeration in the case of must in order to retard fermentation—that is to say, transformation into wine under the influence of ferments—and the merchant has recourse to it for clarifying the wines, for preserving them in a clear condition, and for ageing them. In every case, if the must has been cooled by the viticulturist the wine will be much more clear and the merchant will not have the same need to have recourse to chilling.

The grapes after gathering are delivered to the press, which separates the pulp from the must. The latter is nothing more than the unfermented juice of the grape, which it is desirable to preserve as such, the more so as the new grape syrup industry, which has undergone a considerable advance, makes use of fresh must for concentration. In this case the must is maintained cool in well-insulated vats up to the time of washing, clarification, and separation of tartrates. In other cases it is kept for a somewhat indefinite period in vats maintained at a temperature in the neighbourhood of 0° C.

Different musts have different tendencies as regards fermentation; there are cases where material kept at 10° C. remains perfectly stable. This unlimited preservation of must by cooling allows the viticulturist to produce a new wine at no matter what period of the year, which is a considerable advantage.

Grape syrups prepared from must preserved by cooling possess all the curative properties of fresh grape juice; with the addition or not of aerated water they form a delicious non-alcoholic drink which may readily be sold to abstainers and Mussulmans, for in the case of the latter, although the Koran forbids the consumption of alcoholic drinks it does not prohibit sugary drinks.

Cooling avoids the use of antiseptic substances employed up to the present time for the same purpose; these substances are not without their drawbacks from the health point of view.

The production of wine must be carried out at a determined temperature. When the temperature of the vats is too high, the fermentation process undergoes an abnormal change, which often accounts for accidents, as has been the case in Algeria. In this part of the world the use of refrigeration is obligatory if it is desired consistently to obtain well-made wines. Wines obtained at 16° C. or 18° C. are more fruity and more distinctive in taste than those obtained at 25° C. or above. The equipment required for this refrigeration in the wine industry comprises a group of insulated vats for storing the must at low temperature while the grapes are being gathered, in order to be able to treat it after a shorter or longer waiting period according to the particular case.

The must is cooled by partial evaporation in an evaporator, the interior of which is kept at a very low pressure (3 or 4 mm. of mercury). The must enters the evaporator at 30° or 35° and travels through it in the form of a shower. Under the action of the low pressure, part of the water in the must evaporates, taking its heat of evaporation from the must itself, which in this way reaches the interior of the evaporator in a completely cooled condition. The cooled must is delivered into the preservation vats by means of a pump. This system of refrigeration operates without any added chemical agents, for it is the must itself which provides the heat of evaporation. At the same time, as the must is being cooled, it undergoes a slight concentration of about 10 per cent. Naturally, this operation can be repeated if it is required to concentrate still further.

History of Food Adulteration

(Continued from previous page)

it can be said that it is full of interest to chemists in general and public analysts in particular. We are taken in cavalcade from the beginnings of the old city companies, which are traced from the Pepperers of the time of Ethelred the Unready right through the ages even up to our own time. In this story one can easily trace the evolution of such a body as the Society of Public Analysts, whose ancestors seem to have been the Polliciers and Garbelers, who as far back as 1300 had the task of removing impurities from spices. One is impressed by the initiative of one Henry Jackson, who in 1758 personally analysed over 100 different bakers' breads in order to ascertain the true facts in relation to their alleged adulteration. This would be no mean a task to-day with the aid of modern methods and knowledge; in 1758 it was monumental!

The book ends with a series of interesting appendices and a very complete bibliography. It is well printed and published at the moderate price of 10s., and is to be commended to everyone interested in the chemistry of foods.

T. H. F.

Walnut Cultivation

THE recently issued Annual Report of the East Malling Research Station, Kent, contains an article on walnut propagation in England, by J. B. Hamond. It was Mr. Howard Spence, of Southport, who suggested that something might be done to improve the quality of English grown walnuts by raising grafted trees of approved varieties. He sought the co-operation of East Malling Research Station and the work has been carried on there for the last few years. A demonstration in walnut grafting was held at East Malling in the spring of 1934 and four nursery firms were supplied with young grafted walnut trees of approved varieties in the autumn of the same year. From this nucleus of material it is hoped that these firms will be able to build up a stock from which to obtain scion-wood, and thus to meet the demand for grafted walnut trees in England and elsewhere.

The Training of the Food Technologist

OWING to pressure of space it is not possible to continue publication of Dr. Cronshaw's paper in this issue. The next part will appear in the August number.

INDUSTRIAL NEWS

Sir MacPherson Robertson Visits Philips' Works

On May 16, on his way to Cologne, Sir MacPherson Robertson, who, during his stay in Holland, spoke before the microphone of the well-known Philips' short-wave stations PHI and PCJ and addressed listeners in the Netherlands Indies and Australia, paid a visit to Philips' Works at Eindhoven.

Upon his arrival by car at the head office, the organiser of the London-Melbourne air race was greeted by Dr. Philips. Lunch took place at the Eindhoven Golf Links, after which Sir MacPherson Robertson was shown over the various manufacturing departments of Philips' Works and was very enthusiastic about the modern working methods.

Philips Industrial, the concern which has recently produced a new colour constancy testing apparatus, is a branch of this company.

Association of "Old Cromptonians"

A banquet was held on May 31 to do honour to Col. R. E. B. Crompton, C.B., F.R.S., M.I.E.E., etc., the famous engineer, who was ninety on that day. Nearly five hundred distinguished engineers attended at the invitation of the Presidents of the Royal Society, the Institutions of Civil, Mechanical, and Electrical Engineers, and the International Electrotechnical Commission.

During the course of the banquet Col. Crompton was presented by Sir James Swinburne, Bart., with a photograph of a portrait of himself painted by Mr. George Harcourt, R.A. (The actual portrait was hanging in the Academy at the time, so a photograph was substituted for it.) This was then presented by Col. Crompton to the Institution of Electrical Engineers, of which he has twice been President. The guest of the evening also received from R. E. L. Maunsdell, Esq., C.B.E., M.A., Vice-President of the Institution of Mechanical Engineers, the Certification of his election as Honorary Life Member of that Institution.

▼ ▼ ▼

Charles Arthur Wrench, a director of Stevenson and Howell, Ltd., manufacturing, analytical, and consulting chemists, and hon. secretary of The London Federation of Boys' Clubs, has received the honour of Knighthood.

Society of Chemical Industry

The annual meeting and conference of the Society of Chemical Industry is to take place in Glasgow on July 1 to 6. Many scientists from different parts of the world as well as the British Isles have signified their intention of attending the conference.

The annual general meeting will be held on July 2, and on July 3 the Food Group Session commences and papers will be given on "How Food is Transported by Rail and Sea," by Brig.-Gen. Sir Harold Hartley, C.B.E., vice-president L.M.S. Railway and A. J. M. Smith, Ph.D., M.A., Low Temperature Research Station, Cambridge. Visits have been arranged to a number of works, factories, bakeries, etc.

Extension of Cadbury's Works

Messrs. Cadbury are extending their Bournville Works and ground is already being cleared for a new six-storey building for the manufacture of chocolate confectionery. It is hoped that part of the factory will be in production towards the end of the year for the Christmas trade.

A similar block was erected last year and another block is in hand for the storage of finished goods. In a period of 25 years the floor space of the Cadbury works has increased from less than 800,000 sq. ft. to over 1,750,000 sq. ft.

Glaxo Ltd.

A new factory is being built by Glaxo, Ltd., at Greenford Road, Sudbury Hill, the total area being about 15 acres.

The object is to centralise the company's business, and new laboratories will also be constructed on this site. The company hope to start moving in September and to be in by the following December or January.

▼ ▼ ▼

The Scottish Co-operative Wholesale Society, at their quarterly meeting at Glasgow on June 8, decided to proceed with the scheme for the erection of a new creamery at Dumbarton at a cost of £20,000, and also to rebuild and remodel the Society's creamery at Coatbridge.

▼ ▼ ▼

The Eccles and District Co-operative Society, Ltd., are negotiating for the acquisition of a disused cotton mill which will be converted into a bakery.

Gray, Dunn and Co. Extend

Plans are being prepared by a Glasgow firm of architects for the erection of a new factory for Messrs. Gray, Dunn and Co., Ltd., biscuit manufacturers, Glasgow. The new building, which will be equipped with the latest plant, will be erected on a site at Stanley Street, Kinning Park, Glasgow.

Hanovia Ltd.

Increased business has compelled Hanovia, Ltd., to design and build a new factory at Bath Road, Chippenham, Slough. It is specifically planned for the work of making the company's sunlamps, and increased accommodation is immediately available in all departments. Ample land is provided for future expansion. The new telephone number is Burnham 500 (4 lines).

Ice-Cream Making

A. Boake, Roberts and Co., Ltd., of Carpenters Road, Stratford, London, E. 15, have sent us a copy of the new edition of *A Handbook for Ice-Cream Makers*, by L. J. Hynes. The demand for the first edition was such that a second edition was necessary and the opportunity was taken to revise and enlarge upon the first edition.

The handbook, which is well bound and produced, contains 107 pages and thirteen chapters, each dealing with a certain aspect of ice-cream production. The first chapter deals with The Factory and its Equipment and there are other chapters on the Preparation of the Mix, the Freezing Process, Storing and Hardening, Standardisation, Common Defects and Difficulties, etc. There are also chapters on special varieties of ice-cream, such as vanilla, chocolate, fruit, and nut, etc.

A free copy will be sent to ice-cream makers on application to A. Boake, Roberts and Co., Ltd.

▼ ▼ ▼

The Ministry of Agriculture and Fisheries have sent us their Marketing Leaflet No. 57a, which is a list of authorised packers and registered distributors in the National Mark schemes for fresh fruit and vegetables.

▼ ▼ ▼

Mr. Parkin S. Booth (Association of Manufacturing Chemists, Ltd.), Liverpool and London, has been elected Captain of the Bull Bay Golf Club, Amlwch, Anglesey, for the ensuing year.

A view of the new offices of Messrs. John and E. Sturge, Ltd., at No. 1, Wheeleys Road, Birmingham.

New Offices of John and E. Sturge, Ltd.

Messrs. John and E. Sturge, Ltd., the Manufacturing Chemists, have sent us photographs of their new office buildings at No. 1, Wheeleys Road, Birmingham. The offices are situated only about 200 yards away from the old premises at Wheeleys Lane, where the firm has been established since 1823, the main laboratories remaining on the old site where manufacturing still continues.

The new offices occupy a main corner site, easily accessible from the centre of the city. A large courtyard and a bank reserved for shrubs or flower-beds separate the building from the main road, thus giving a pleasing sense of light and airiness to the whole premises.

The premises are served by a private automatic branch telephone exchange which gives communication to the laboratory and manufacturing premises, and with the Company's other factory at King's Norton, five miles distant.

Ventilating Equipment

We have received from Davidson and Co., Ltd., Sirocco Engineering Works, Belfast, a copy of their illustrated brochure depicting the ventilating and allied equipment which they produce, including fans, air-conditioning units, air washers, unit heaters, dust-collecting equipment, etc.

The centrifugal and propeller fans are manufactured in a variety of designs and ranges of sizes, as are also the heating and air-conditioning equipment.

Lowering Heat Costs

Most industries use heat, and with the demand upon present-day works for economy and increased outputs the production and employment of heat has become a matter of major importance. Anything that can reduce costs and increase efficiency in this direction will therefore greatly help progress.

J. H. Sankey and Son, Ltd., offer a product termed "Pyruma," which is stated to possess unequalled bonding, hard-setting, and heat-resisting properties. It is already in use in many heat-consuming industries, and has definite advantages over fireclay in the bonding or welding of fire-bricks together.

A recent booklet issued by this firm demonstrates the difference between fire-brick work bonded with "Pyruma" and that set with fireclay. "Pyruma" is said to weld the fire-bricks together into one solid and intensely heat-resisting mass.

The B.A. Holland Engineering Co., Ltd.

We have received from the B.A. Holland Engineering Co., Ltd., of 18, Victoria Street, London, S.W. 1, a copy of a pamphlet dealing with their air compressors, gas compressors, vacuum pumps, oil and moisture separators, low pressure blowers, gas boosters, diesel engines, etc. There are illustrations of the company's products, and it is stated that the Holland/S.L.M. rotary compressors and vacuum pumps have given uninterrupted service for many years on day and night duty.

Distance Thermometers

Catalogue No. 840 of Elliott Brothers (London), Ltd., deals with Siemens Electrical Distance Thermometers. These thermometers possess the advantage of having one temperature indicator which may be fixed in any convenient central position and on which may be read the temperature on any number of thermometers in widely separated positions. The instruments cover a temperature range of −200° to +500°, and any thermometer is instantly read on the central indicator by merely pressing a button or turning a switch.

Density Hydrometers

The Hydrometer Sub-Committee of the British Standards Institution have prepared a draft specification for British Standard Density Hydrometers and tables for use with the hydrometers. The draft specification and tables are now being circulated to interested bodies by the Institution for criticism prior to their final publication.

The Institution would welcome comments on the proposals from as wide a circle as possible, and a copy of the draft specification and tables will be forwarded to anyone interested on application to The Director, British Standards Institution, 28, Victoria Street, London, S.W. 1.

Chemical Balances and Weights

A new catalogue of British Chemical Balances and Weights, made by L. Oertling, Ltd., of 65, Holborn Viaduct, London, E.C. 1, has just been received. Messrs. Oertling, Ltd., are an entirely British firm, having been established in London as long ago as 1849.

The catalogue is of the loose-leaf type so that other sheets can be added from time to time. The cover is strongly made as well as having a pleasing appearance. The illustrations are unusually well reproduced and show all types of balances from the ordinary chemical balance to the latest Aperiodic and Micro Balances.

Pyrometer Lance

From America comes a new pyrometer of the portable or lance type at a low price. It includes the complete equipment with the exception of the thermocouples and is produced by the Russell Electric Company. Meters are available for three different temperature ranges of 800° to 1,006° to 2,500° F.

The instruments are of the low resistance type, thereby combining accuracy in combination with strong construction. These new instruments are stream-lined in conformity with modern tendencies in design. The entire protecting case and handle is a single aluminium casting.

Celilynd Packaging Process

An extremely interesting demonstration took place on May 30 at the factory of D. Smith and Sons, 97, Lea Bridge Road, London, E. 10, where we were able to inspect a new machine and process for lining paper-board and other fabrics with transparent materials of the viscose type. The problem of making transparent paper adhere to paper-board has presented great difficulties, but a recent invention owned by Celilynd Patents, Ltd., a company controlled by D. Smith and Sons, now makes this possible. The machine, which is the only one of its kind in existence, accomplishes this feat in a satisfactory commercial manner.

This will undoubtedly be of the greatest interest to manufacturers of boxes, packages, etc., for more and more attention is being paid to the colourful design of packaging materials. Samples of boxes made from board lined with transparent material by this process show that the covering adheres securely to the board. Even at the cut edges there is no sign of separation. Designs can be imprinted on the surface as the covering is applied. A photograph of boxes made by this process appears on this page.

Card Dusting and Conditioning

The first demonstration of a new machine made by R. W. Crabtree and Sons, Ltd., Leeds, was given at D. Smith and Sons' factory at 97, Lea Bridge Road, London, E.10, on May 30. This machine conditions and dusts paper and board before printing, and is one of the patents handled by Machinery (Smith's Patents), Ltd.

It was stated that experience showed that in printing in six colours and gold perfect register is obtained and the general appearance of the work is much improved with less trouble. On an ordinary machine there would be a wastage in printing of 2½ per cent.; on the new machine the wastage is reduced to 1 per cent. Also, owing to the avoidance of stops for cleaning, there is a saving of time amounting to 25 per cent. There is also a 10 to 15 per cent. saving in ink, and in printing in bronze the danger of the health of employees is minimised.

▼ ▼ ▼

British Cellophane, Ltd., of 179, Tottenham Court Road, London, state that they are the owners of the registered trade marks "Cellophane" and "Viscacelle." "Cellophane" is offered direct to the trade by the company itself, while "Viscacelle" is distributed by Messrs. Nathaniel Lloyd and Co., Ltd., of Burrell Street, Blackfriars, London, who are the agents in Great Britain and Ireland.

Examples of the new "Celilynd" boxes in squares, pebble, spider-web and wood-grained patterns.

Substitute for Transparent Paper

According to Professor Ernst A. Hauser, the eminent Viennese chemist, who is returning from a world tour via the Far East, an American firm is placing on the market a substitute for transparent cellulose papers made entirely of rubber.

Glues, Pastes and Gums

National Adhesives, Ltd., of Slough, Bucks, have sent us a copy of their booklet *How to Prepare and Use Glues, Pastes, and Gums.* They state that it has been published in the interests of users of these products to assist them in obtaining greater efficiency and economy by the proper handling and use of adhesive products. The booklet has been tastefully produced, and treats in a general way with the major problems that arise daily in factory and plant work. The subjects covered include: Storage and care of glue, thinning prepared glues and pastes, dry animal glues, flexible glues, etc. Copies of the handbook will be sent to anyone interested on request, and the company are also prepared to help solve any problems which may arise in any particular field of operation.

Ajax Trucks

We understand that Ajax Trucks, Ltd., are developing a new line, which will be a very considerable improvement over their already well-known appliances for mechanical handling in factories.

"Beth" Label and Wrapper Machines

The "Beth" Label and Wrapper Machines, Ltd., of 33, Dagmar Road, Finsbury Park, London, N. 4, have sent us a copy of their brochure, which is attractively produced and on the front page has an illustration of the "Beth" portable labelling machine.

The company state that they are prepared to install a "Beth" labelling machine on any premises for a short period without obligation so that its efficiency under actual and individual working conditions may be tested. The machines can be adjusted to all sizes of round containers, and the output is from 2,000 to 7,000 per hour labelling, while, since no paste touches the container, there is no danger of rust or other form of corrosion.

New Glass

The Thermolux Glass Company, a subsidiary of the Triplex-Safety Glass Co., Ltd., is making a new type of glass which influences both the temperature and lighting of buildings so glazed.

The new product consists of two panes of ordinary clear glass with a middle layer of glass silk, through which the rays of the sun do not pass, as through ordinary clear glass. The special properties of the product, it is claimed, result in an almost entire absence of shadow.

New Morris-Commercial Four-Tonner

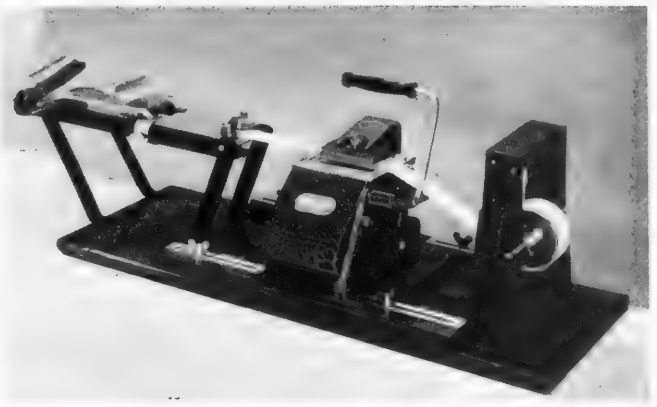
Transport users have been eagerly anticipating the introduction of a popularly priced, maximum load, four-wheeled commercial vehicle which may legally travel at 30 m.p.h. The new model introduced by Morris Commercial Cars and christened "The Leader" fulfils these conditions, as it weighs under 50 cwt. unladen, qualifies for the £30 annual tax, and is legally entitled to travel at 30 m.p.h. with the 4-ton loads which it is more than capable of carrying. These advantages have not been obtained at the expense of adequate body space, as on the new chassis a body 14 ft. long can be fitted.

The makers have taken into account every factor which the transport user has foremost in mind. By affording a normal driving position, but mounting the engine well forward, it has been found possible both to provide the large body space already mentioned and at the same time ensure maximum engine accessibility. On points of detail it is refreshing to find, for instance, such a refined accessory as self-cancelling electric direction indicators, the control of which is conveniently mounted on an arm extension of the steering column, as also is a trigger which enables the headlamps to be both dimmed and switched downwards for the convenience of other road users.

The new model is equipped with a powerful four- or six-cylinder engine according to the user's choice, a heavy duty single plate clutch which requires no adjustment in service, a four-speed gearbox, the bottom gear ratio of which is low enough to enable the machine to tackle the worst hills likely to be encountered, and a spiral bevel gear rear axle from which the axle shafts can be removed without disturbing other parts of the unit. Adequate controllability on the road is assured by the Lockhood hydraulic braking system. Fitted with a lorry body and fully enclosed driver's cab, the new model sells at £325 with a four-cylinder engine and £333 with a six-cylinder engine.

Methyl Bromide Fire Extinguishers

The National Fire Protection Co., Ltd., of Petersham Road, Richmond, produce fire extinguishers containing methyl bromide, a highly potent fire fighting liquid. Numerous demonstrations have been carried out by setting fire to various inflammable materials, and in each case the fire was rapidly extinguished. This type of protection should be of value to food manufacturers operating apparatus and processes utilising highly inflammable substances. The company produce a large range of types and sizes of extinguisher.



The new "Langapres" tape and label printing machine described below. The clean construction and accessibility of all the parts can be clearly seen.

Brook Motors

Brook Motors, Ltd., have now made more than 100,000 of their standard protected type alternating current electric motors. Their motors are fitted with ball and roller bearings, lubricators, oversize shaft, and an indestructible cage rotor with welded copper end rings. It is capable of running in any reasonable atmosphere and running only on its two bearings has no friction points.

The company also produce a motor in a totally enclosed surface cooled frame which cannot choke and will continue to operate under adverse conditions of dirt or moisture. When fitted with a trifurcating box over its terminals it is stated to be safe in the presence of cellulose paint fumes.

Brush Electrical Engineering

We have received from the Brush Electrical Engineering Co., Ltd., of Loughborough, copies of two recently issued brochures entitled "Pioneers for 50 Years" and "Brush Motor Converters." They are attractively produced and demonstrate with many illustrations the range of this company's products. The first brochure is in green and gold with a picture of the company's works on the front cover. Inside are illustrations of transformers, turbo-generators, rotary converters, etc. The second is in brick red and cream, is well illustrated, and deals with the company's motor converters.

Cast Iron Chemical Plant

Cannon Iron Foundries, Ltd., of Deepfields, Bilston, Staffordshire, have issued two leaflets illustrating some of the cast iron chemical plant which they manufacture. The company's products cover a wide and varied range of condensers, crystallisers, evaporating pans, mixing pans, steam-jacketed pans, stills, tanks, and pipes for nitrating, mixing, condensing, distilling, evaporating, and other chemical processes.

A New "Langapres" Model

The new "Langapres" machine, made by Lang, Clayden, Ltd., has a printing area of 3 in.×$1\frac{5}{8}$ in. and can deal with paper tape, gummed and ungummed, of variable width from $\frac{1}{4}$ in. up to 8 in. long. The machine is hand operated and can be worked by a junior, and labels can be cut and printed at rates up to and exceeding 50 per minute—3,000 per hour—a very high output.

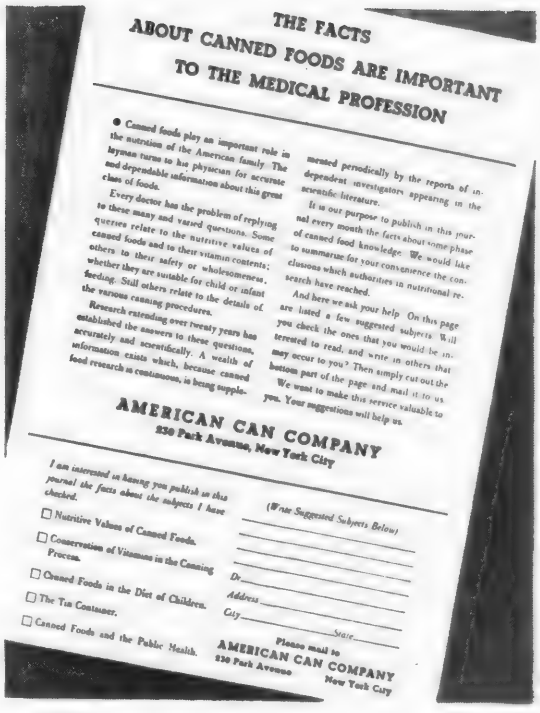
The "Langapres" machine uses standard printers' type or type-high blocks. It is mounted on an adjustable sliding base to ensure the printing always being in the centre of any size label. After printing, the tape is automatically cut to the desired length. The production cost of labels measuring, say, $1\frac{1}{4}$ in.×4 in. long works out, according to the makers, at almost 1s. 2d. per thousand, including the cost of paper, tape, and labour.

The machine may either be employed as a separate unit or it can be run as an adjunct to existing plant, for the over-printing of can labels, for example. A photograph of the machine appears above.

Twin-Cylinder Drying Machines

Bertrams, Ltd., of St. Katherine's Works, Sciennes, Edinburgh, have sent us a pamphlet descriptive of their twin-cylinder drying machine. The machine can be used for evaporating to dryness mineral and chemical compounds, milk, starches, chocolate, etc.

The machine is especially designed for evaporating liquid substances containing solids in suspension, and consists of two steam-heated drying-cylinders revolving in unison. A film of the liquid is deposited on and adheres to each of the cylinders, and is dried before the cylinders make a complete revolution. The company also supplies accessories for producing powder from the dried material without handling.



THE FACTS
ABOUT CANNED FOODS ARE IMPORTANT
TO THE MEDICAL PROFESSION

• Canned foods play an important role in the nutrition of the American family. The layman turns to his physician for accurate and dependable information about this great class of foods.

Every doctor has the problem of replying to these many and varied questions. Some queries relate to the nutritive values of canned foods and to their vitamin contents; others to their safety or wholesomeness, whether they are suitable for child or infant feeding. Still others relate to the details of the various canning procedures.

Research extending over twenty years has established the answers to these questions, accurately and scientifically. A wealth of information exists which, because canned food research is continuous, is being supplemented periodically by the reports of independent investigators appearing in the scientific literature.

It is our purpose to publish in this journal every month the facts about some phase of canned food knowledge. We would like to summarize for your convenience the conclusions which authorities in nutritional research have reached.

And here we ask your help. On this page are listed a few suggested subjects. Will you check the ones that you would be interested to read, and write in others that may occur to you? Then simply cut out the bottom part of the page and mail it to us. We want to make this service valuable to you. Your suggestions will help us.

AMERICAN CAN COMPANY
230 Park Avenue, New York City

I am interested in having you publish in this journal the facts about the subjects I have checked.

(Write Suggested Subjects Below)

☐ Nutritive Values of Canned Foods.
☐ Conservation of Vitamins in the Canning Process.
☐ Canned Foods in the Diet of Children.
☐ The Tin Container.
☐ Canned Foods and the Public Health.

Dr.
Address
City State

Please mail to
AMERICAN CAN COMPANY
230 Park Avenue New York City

An example of the advertising used by the American Can Company to put before doctors, dentists and health officers of America the scientific facts about canned foods.

Mechanical Pea Picker

We have received from Carter's Tested Seeds, Ltd., of Raynes Park, London, S.W. 20, who are the sole agents for the British Isles, a copy of a pamphlet descriptive of the "Simplex" Mechanical Pea Picker. This machine sorts dried peas, automatically rejecting those which have been attacked by worms or maggots. Hitherto, this had been done by hand, and skilled labour of the kind required was rapidly becoming unobtainable.

The full-sized machines are about 2 ft. in diameter and 7 ft. long, and have a capacity of 100 lb. to 115 lb. of peas an hour. Errors in picking are about 1 per cent., whereas the faults in hand-picking are always considerable, being as much as 5 to 7 per cent., often more. Tests have proved that about 100 tons of peas can be picked satisfactorily without any replacements. One "Simplex" pea picker, driven by a $\frac{1}{3}$-horse-power motor, picks 8 cwt. of "Harrison's Glory" peas in 8 hours 45 minutes, the only attention required being to take off the sacks as they are filled.

Food Colours

The Warner-Jenkinson Company, of 2520, Baldwin Street, Saint Louis, U.S.A., have sent us a copy of their recently issued booklet on *Food Colours*. The booklet is well produced and gives on the first page a list of coal tar dyes sanctioned by the United States Government for use in the colouring of foods and beverages. These are dyes which have been proved to be physiologically harmless when prepared in a pure condition.

Originally there were only seven certified colours, but the number has now been extended to fifteen, while secondary certified colours can be prepared by mixing together two or more primary colours. Information is given on how to use colours, preparation of liquid colours, amount of colour to be used, the properties and applications of primary colours, etc.

The Warner-Jenkinson Company will send a copy of the booklet to anyone who is interested in food colours.

Incompatible Materials

We have received from John Bale, Sons and Danielsson, Ltd., a Table of Incompatibles printed in the form of a chart on a broadsheet, from which it is quickly possible to determine graphically whether one chemical substance is compatible with another. The number of substances covered is naturally limited to the size of the chart, but the range is quite varied. The majority of the substances listed are used in pharmaceutical preparations.

On the back of the sheet is printed some miscellaneous information and a list of reducing and oxidising agents, explosive compounds, deliquescent substances, etc.

George Angus and Co., Ltd.

In recent times many important changes have taken place in systems of transmission, which have been necessary to keep pace with the rapid strides made in the plant and equipment of the modern factory. Consequently, in the case of belt drives, it has become a very technical matter to decide which is the correct belt to use for any particular drive. George Angus and Co., Ltd., offer to their customers a service which includes the assistance of one of their technical staff to advise on any drive that may be proving awkward, and they will then supply the type of belt which they consider likely to give the most satisfactory service. By availing himself of this service the plant engineer greatly reduces his worries and has the satisfaction of obtaining the best form of power transmission for his particular needs.

Among the many well-known Angus brands is "Northumbria" leather belting, which is of the very best quality, only the centres of first-selected English ox strap butts, specially tanned, being used. The processes through which these centres have to pass ensure a stretchless and flexible belt. Further, these belts are "run-in" before leaving the factory, so that there is no necessity for the consumer to do so, which normally takes time and costs money, particularly if he uses a quantity of leather belts in the course of a year.

At their Newcastle-on-Tyne factory all types of mechanical leather goods, such as hydraulic leathers, oil retaining leathers, cash bags, etc., are produced, whilst at their Bentham Mills in Yorkshire, Messrs. Angus manufacture hair, cotton, and all textile beltings, as well as the popular Angus canvas hose, of which "Fire Chief" brand is in use by almost every large brigade at home and overseas. A résumé of this progressive company's activities would not be complete without a brief mention of their mechanical rubber and asbestos goods; Balata, rubber and canvas beltings, and their latest product for short-centre, high-ratio drives—"Gatex"—the flat belt that is creating so much interest at the moment.

A gear works is a most necessary adjunct of any firm of transmission engineers, and the Angus gear works are among the most modern in the country, where almost all types of gearing can be cut, and a speciality is made of silent gearing, such as rawhide and Durangus pinions, or "Maag" gearing for high speed, heavy duty drives where silence and long life are the chief considerations.

INFORMATION and ADVICE

Hydrogen Swells—Coffee Packing—Soya Bean Products —Marshmallow Cream—Spice Grinding—Jam Making— Horseradish Cream—Grenadine Syrup—French Mustard —Lemon Curd

Hydrogen Swells

1,878. *We remember having read in* FOOD MANUFACTURE *that researches are going on into the extremely annoying appearance of "slightly bulging" tins in packs of preserved fruits (no blowers). We believe that such tins are called "slacks" on your side. We have had this experience once in a while, notably in packs of cherries, in spite of having taken most careful steps to avoid it. We would like to know if any* 100 *per cent. remedy has been found for this.* (Holland.)

By "slacks" we shall presume that you mean cans which have become bulged or domed at the ends through internal pressure of hydrogen. These are formed as the result of the attack of fruit acids on the can, and are usually known here and in America as hydrogen swells. They are more commonly found with cans which have been lacquered by the usual methods than with plain cans, although lacquering is necessary in the case of fruits with coloured juices to protect the colour. It is also a fact that fruits of moderate or low acidity, particularly stone fruits like cherries, often give more trouble than fruits of higher acidity.

It is safe to say that there is no remedy for hydrogen swells which can be guaranteed as 100 per cent. efficient. There are, however, various ways of mitigating the trouble, some of which involve extra expense, while others are relatively inexpensive. These remedies are as follows:

(1) *Artificial Cool Storage of Cans.*—This is probably the most effective remedy, both as regards checking the hydrogen swells' formation and discoloration. It is safe to say that cans may be stored for a year or more at about 32° F. with little or no perceptible deterioration, but as the storage temperatures increase deterioration becomes more rapid.

(2) *Triple Lacquering.*—Cans made from sheet which has been twice lacquered on the flat, as in ordinary practice, are sprayed internally with a quick-stoving lacquer to cover up damage done at seams in fabrication. Damage through final sealing can be made ineffective by stacking the cans with the lids uppermost.

(3) *A reasonable Head-space* of about $\frac{1}{8}$ to $\frac{3}{16}$ of an inch should be allowed so that there is a certain amount of space to fill up before pressure develops.

(4) *The Exhaust* should be efficient both to eliminate oxygen as far as possible and to ensure a good vacuum in the can.

(5) *Lids* may be stiffened somewhat (*i.e.*, made of heavy tinplate) so that they do not readily respond to slight internal pressure.

(6) In the case of certain fruits of low capacity *the addition of* 0·3 *to* 0·5 *per cent. of citric acid* to the syrup has been found to be beneficial. Cherries and canned dried prunes particularly respond to such an addition, while greengages and other plums do so to a less extent.

(7) The use of sugar containing *an inhibitor of the corrosion of iron* has been shown to retard the rate of hydrogen swells with many fruits. Most beet sugars have some inhibiting properties, which may be strengthened by the use of a proportion of unrefined beet sugar, although care must be taken to see that such sugar does not affect the colour or flavour of the product.

(8) There is evidence that both the *porosity* of the tinplate coating and the *quality* of the steel base affect the rate of formation of hydrogen swells, but these are matters which are under consideration by research workers, and it is hardly possible for the canner to exercise much discrimination as regards tinplate at present.

1,879. *Referring to question No.* 1,710 *in your November,* 1934, *issue, we should like to know if lactalbumin can be purchased, and, if so, would you please give names of likely suppliers?* (Devon.)

Suggestions were made.

1,880. *What books can I obtain which are mainly or wholly devoted to Pectin?* (London.)

Suggestions were made, including books by Rooker, Morris, and Chilson.

1,881. *We would be much obliged if you could send us recipes for a condiment similar to the one sold by Messrs. Colman.* (Paris.)

We obviously cannot give any information regarding proprietary products. The enquirer was advised to get in touch with a consulting chemist.

Coffee Packing

1,882. *A co-operative society of coffee planters has been formed here for the purpose of marketing roasted and ground coffee. It is proposed to put up pure coffee and a blend. I should be grateful for information regarding possible ingredients of a blend. I should mention that chicory grows fairly well here.*

It is thought that the most suitable packing would be in tins and, in order to preserve the aroma, that the coffee should be packed in vacuum and the tin hermetically sealed. I should be greatly obliged if you would kindly give me information regarding packing in vacuum and, should special apparatus be required, where this might be obtained. Electricity, however, is not available, although, if essential, we should consider generating current by water power.

As regards tins, it is proposed to use those with an inner cover which can be sealed, and an outer lid furnished with a cutter for opening the inner cover, such as is commonly used for cigarettes and tobacco. We probably could not undertake to make our own tins at the present stage, and I should be glad, therefore, if you would be so good as to advise me where suitable tins could be obtained. They would, however, have to be sent here in a flat or partially flat condition, as the bulk of completely formed tins would make the ocean freight prohibitive. Perhaps the firm supplying the tins would also be able to supply the necessary machine or machines for reforming the tins.

The tins are to be of 1 lb. capacity. (Rhodesia.)

Some general advice was given and recommendations as to sources of equipment were made.

1,883. *In your publication* FOOD MANUFACTURE *for February, pages 57 to 58, you mention the latest method of dressing poultry by wax. We shall be glad if you can give us any further information regarding this method and whether you have the address of the Barker Poultry Equipment Co. in America.* (Ireland.)

We are afraid that the article to which you refer is the only information we have on the subject, and think that your best plan would be to get into touch with the author of the article—namely, Dr. Tilgner.

1,884. *I should be glad if you could supply me with recipes for the manufacture of ice-cream powder for cold mix and for cooked mix.* (Bristol.)

The article on this subject published in the June, 1934, issue should give you all the information required.

1,885. *At the Dairy and Ice-Cream Exhibition held at Olympia I saw the American made Taylor Freezer. Can you give me the name of the exhibiting firm?* (Eastbourne.)

This was given.

Soya Bean Products

1,886. *Would you kindly supply me with a method for extracting lecithin from soya bean and also advise me as to the most suitable fat to incorporate with same? What type of machinery is necessary for manufacturing soya bean flour (fine)? Is the outer skin removed from the bean and the oil extracted before grinding into flour? Where can soya beans be purchased at the lowest possible price?*

I was very interested in the article "Retarding Rancidity" published in the July issue of FOOD MANUFACTURE, *and I should be obliged if you could supply me with the names of the manufacturers of maleic acid and also information as to the maximum amount of the acid that can be incorporated with cod liver oil, and whether it is harmless in human foods.*

If you could kindly supply me with any information which would assist me in producing a stable mixture of malt extract and 15 per cent. of cod liver oil. My present mixture commences to separate after a period of four months, and if your suggestions result in a stable mixture of the two I would be most grateful.

Could I impose upon your generosity still further and ask you to supply me with a formula for the manufacture of white invert sugar for use in the cake and baking trades? (Australia.)

I am afraid that we cannot be of much assistance, as you are asking for information which really falls within the province of the consulting chemist, and before these questions can be properly answered one would have to know a great deal more about the particular circumstances under which you propose to manufacture—that is to say, the extent of output, amount of capital available, and so forth.

It is best to remove the outer skin before attempting to prepare soya bean flour. The lecithin is removed with the oil on expressing and is then extracted by a solvent process. The subject is far too big to be handled by casual correspondence.

The enquirer was referred to previous information we have published on maleic acid.

Recipes were quoted for malted cod liver oil emulsions.

Particulars of plant and process for inverting sucrose may be obtained from the manufacturers.

1,887. *If it is possible for you to oblige us, we would like recipes for the following:*

Cake Powder,
Bun Powder,
Sponge Powder Mixture,

all to be of a quality suitable for putting up into small packets for retail over a grocer's counter. (Lancashire.)

We are afraid that this is far too big a subject for us to deal with, and it cannot be dealt with satisfactorily by quoting a few recipes. The variety of mixtures is considerable and depends on the particular type of cake, etc., at which you are aiming.

Recommendations as to sources of information were given.

1,888. *One of our Colonial Agents has put us in touch with a large canning firm who have a regular output of concentrated meat extract and asks us if we can find an outlet for it.*

This is really not in our line of business, but as we want to be helpful to them we are wondering if we can put the firm in touch with a house who would be able to market the product. Could you recommend us a firm of merchants who have regular business with the users of meat extract? (London.)

Your best plan would be to put a small advertisement in this journal.

Marshmallow Cream

1,889. *We should appreciate it a favour if you could let us have a recipe for marshmallow cream suitable for marketing.* (Lancashire.)

These vary to a considerable extent, and before giving a recipe it is desirable to learn the purpose for which it is to be used. Your best plan is to put your proposition in the hands of a food technologist.

They are beaten mixtures of sugar-glucose syrup stabilised by colloids such as albumen, gelatin, etc., and the particular ingredients used, the balance of same, and the kind of machine used in the manufacture, are all factors which play an important part in forming the texture of the resulting product.

As an example of a really cheap kind of marshmallow, the following can be instanced:

1 lb. gelatin soaked in 1 lb. water.

Boil to 239° F. 23 lb. sugar and 5 lb. glucose in 7 lb. water, and pour the syrup on to the liquid gelatin in the beater. Beat up until a stiff mass is obtained. Some fat can be added to the mix if desired to shorten the cream, and the above will take up to 2½ lb. by adding the melted fat slowly to the beaten mass in the machine with the beater working. Albumen can be incorporated and/or various other colloids.

Spice Grinding

1,890. *We should like to know if spices can be ground in the disintegrator type of grinding machine.* (Scotland.)

We understand that disintegrators are quite largely used for grinding spices. Materials containing much oil have to be put through twice. The enquirer was advised to get in touch with the manufacturers of these machines.

1,891. *We would be much obliged for a working formula for Worcestershire Sauce.* (Singapore.)

As so much depends on the type required, there is not much point in quoting recipes. Some general information was given.

1,892. *Can you supply us with a commercial formula for the manufacture of table jellies?* (England.)

The enquirer was referred to an article on this subject which was published in the September, 1934, issue.

1,893. *As large importers and distributors of olive oil, we are preparing a small booklet describing the many uses of this commodity. This booklet will be distributed by retailers among their customers.*

Apart from the domestic and culinary uses, olive oil is largely employed in medicinal ways, and in describing these we understand that the wording must be of a guarded nature in order to comply with certain legal requirements. Will you please be good enough to let us have some information on this point? (England.)

With regard to the use of olive oil in medicinal preparations, we do not know of any legal restrictions or requirements, other than the necessity for complying with the standards of the B.P.

Jam Making

1,894. *When SO_2 preserved pulp is used in jam making, how can the SO_2 be removed from the pulp? Please give recipes and information for manufacture of raspberry jam from SO_2 preserved pulp.* (England.)

This information was given, and the enquirer was referred to Mr. Potter's article on jam manufacture in the present issue.

1,895. *We should like to have your advice on the following points relevant to jam making: If the jam jar is not well filled and should the jam shrink below the neck, the waxed disc will not cover all the surface of the jam and mould is likely to set up around the exposed edge. We have seen this happen, the jam immediately under the disc being perfect and a ring of mould around the edge eating its way downwards.*

What are Everns strawberries? (Ireland.)

With regard to mould on jams, the phenomenon noticed by our reader of mould growing round the edge of jam which has shrunk in the jar is a very common occurrence in such cases, and is caused by the jelly "weeping," due to mechanical pressure, the exuded liquid being a relatively dilute syrup. The remedy is obviously to allow for this shrinkage when filling, so as to keep the jam above the shoulder of the jar.

The Everns strawberries mentioned are often used for making good quality jam, and are just selected fruit canned with a minimum of covering liquid (usually just water). We believe at the time of packing that the cans are filled as full as possible consistent with non-crushing of the fruit, and that hot water is poured over them before sealing. As strawberries contain a large percentage of water, the fruit shrinks and the juice increases the bulk of the water used for covering the fruit. It is for the same reason that ordinary canned strawberries, when opened after processing, appear to contain a small proportion of fruit and an abundance of syrup. We feel sure that, on request, the packers of Everns strawberries would furnish you with the amount of actual fruit per 5-kilo can, and the amount of added water. They are a long pointed variety of strawberry grown in Holland. They are very firm berries with a good flavour, and it is on account of these two properties that they are used extensively in the jam trade. They are imported into this country either in cans or in casks preserved in SO_2. In the case of the latter there is usually a proportion of water added (about 10 gal. per cask) in addition to the preservative, but as the casks are sold on the basis of a net weight of fruit this has not to be allowed for in the cost, but it should be taken into consideration when working out a recipe.

1,896. *We have received a request from friends who desire information as to the process of manufacture on a large scale of farina and dextrine for human consumption and also animal feeding. We believe that at present these manufactures are mainly in the hands of Dutch, Danish, and German concerns.*

Our friends would also like to receive the names of British manufacturers of the plant required to operate the process. (London.)

Recommendations were made.

Horseradish Cream

1,897. *Kindly give information on the manufacture of horseradish cream. What preservative is used?* (Hunts.)

Generally speaking, horseradish should be dried and grated. There is no preservative used beyond vinegar. A certain amount of corn meal is usually used for thickening, and the other ingredients are sugar, salt, condensed milk, gum tragacanth, and flavouring spices such as ground mace. The corn meal is made into a paste with the vinegar.

1,898. *I duly received your letter of February 23, giving a recipe for Tomato and Apple Chutney, for which I thank you. I have tried this out and find it very good, but I would like to have a recipe for Fruit Chutney only*—no tomatoes. *This is a line for which I have been asked several times, and I would be greatly obliged if you would let me have a recipe.* (Scotland.)

An example was submitted.

1,899. *Please furnish us with a recipe for the processing of walnuts in brine for ordinary pickled walnuts (sour) and sweet pickled walnuts.* (Amsterdam.)

An example was given.

1,900. *We shall be very much obliged if you will furnish us with a recipe for making chocolate fondant.*

See Scarborough's book on Sweet Manufacture.

Grenadine Syrup

1,901. *We would very much like to learn how grenadine syrups are made. Have you any information?* (U.S.A.)

We are afraid that we have no information on this. Perhaps one of our readers may know something about it?

French Mustard

1,902. *I shall be greatly obliged if you will give me one or two recipes for French Mustard of the well-known "Bordin" type.* (London.)

By far the best way of tackling this, if you are taking up the manufacture of this product at all seriously, is to commission a food chemist to make up a range of samples to match or improve upon the particular product in which you are interested.

We quoted a recipe to illustrate the composition of French mustard.

Lemon Curd

1,903. *Could you possibly let us have a recipe for lemon curd? We are having some difficulty with our own recipe; the curd is inclined to crack.* (Ireland.)

You may be filling too hot. The temperature should be below 180° F. when it is poured. Try the accompanying recipe.

NEW COMPANIES

AMBLER'S, LIMITED. To take over the bus. of bakers and confectioners, etc., cd. on at 5, Penrhyn Road, Colwyn Bay, as "Ambler's". Nom. Cap.: £1,250. Dirs.: F. W. Sadler, 5, Penrhyn Road, Colwyn Bay; W. R. Nosworthy, Coed Eryt, Woodland Park, Colwyn Bay; G. W. Ambler, address not stated.

DAD'S COOKIE COMPANY (GREAT BRITAIN), LIMITED. To develop and turn to account a certain recipe, formula, and process; to manufacture biscuits, etc. Nom. Cap.: £5,000. Dirs.: E. A. Wheeler, W. R. Turnbull, and R. McJannet, address not stated. Subs.: F. Willis, 57, Creighton Avenue, N. 10; E. B. Godfrey, 117, Ivydale Road, S.E. 15.

EDWARD LAYCOCK, LIMITED. 15, Stone Bridge Lane, Oswaldtwistle. To carry on the bus. of producers and mnfrs. of and dlrs. in milk, ice-cream, butter, etc. Nom. Cap.: £100.

FOUDGITA, LIMITED. 140, Piccadilly, W. 1. To carry on the business of mnfrs. of and dlrs. in fudge, chocolate, sweets, etc. Nom. Cap.: £200.

GOLDEN BLOCK, LIMITED. 4, St. Bride Street, E.C. 4. To carry on the bus. of mnfrs. of and dlrs. in provisions, confections, foodstuffs, etc. Nom. Cap.: £100.

HADEN (BUTCHERS), LIMITED. 88, High Road, Ilford, Essex. To carry on the bus. of butchers, etc. Nom. Cap.: £10.

H. SMITH (PURITO PRODUCTS), LIMITED. To carry on the bus. of makers and dlrs. in pickles, sauces, condiments, etc. Nom. Cap.: £1,500. Dirs.: H. Smith, 30, Norley Drive, Sale Moor, Ches.; Mrs. A. Smith, 30, Norley Drive, Sale Moor, Ches.

JUVELS, LIMITED. To carry on the bus. of bakers, etc. Nom. Cap.: £1,000 in £1 shares. Dirs.: Mrs. P. McNamara, 35, Alderwood Crescent, Walkerville, Newcastle-on-Tyne (permanent); M. Verraes, 42, Auburn Gardens, Fenham, Newcastle-on-Tyne; P. P. Dunlevy and Jane O'Neill, addresses not stated.

KEARSLEY BAKERY, LIMITED. 434, Back Bolton Road, Kearsley, Lancs. To carry on the bus. of bakers, confectioners, etc. Nom. Cap.: £300.

KENDALL'S FOOD PRODUCTS, LIMITED. To take over the bus. of a potato crisp and confectionery mnfr. cd. on by H. L. Kendall at Hillcroft, Merlin Avenue, Wotton-under-Edge, Glos.

LEO DAVID CASING, LIMITED. 114 to 118, City Road, E.C. 1. To carry on the bus. of mnfrs. and sellers of sausage skins, etc. Nom. Cap.: £1,000.

LINSCOTTS BAKERIES, LIMITED. To carry on bus. as bakers, etc. Nom. Cap.: £500 in £1 shares. Dirs.: K. B. V. Cook, 72, Friern Watch Avenue, Finchley, N.; Eileen Swain, address not stated. Sub.: G. J. Swain, Eden Wood, Heatherside, Camberley.

M. ROSIN, LIMITED. To take over the bus. of a baker and confectioner cd. on by M. Rosin at 27, Peter Street, W. 1, and elsewhere. Nom. Cap.: £10,000. Dirs.: M. Rosin, 4, Gresham Gardens, N.W. 11; A. Rabson, 38, Basing Hill, Golder's Green, N.W. 11; I. Kausman, 4, Gresham Gardens, N.W. 11; B. Rappaport, 166, Hendon Way, N.W. 2.

PACKERS (SCOTLAND), LIMITED. To carry on the bus. of mnfrs. of and dlrs. in potato crisps, biscuits, etc. Nom. Cap.: £400. Dirs.: H. Bradley, 36, Wood Road North, Old Trafford, Stretford, Manchester; L. Martin, Bucklow House, Mere, Knutsford, Ches.; S. Waite, Marstan, Mere, Knutsford, Ches.; A. C. Mingins, 20, Nith Street, Riddrie, Glasgow.

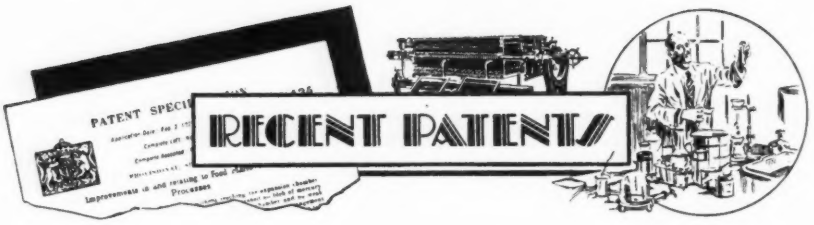
PAGE AND SHAW (1935), LIMITED. Bath Road, Hounslow. To take over the bus. of chocolate and sweetstuff mnfrs. cd. on by Page and Shaw, Ltd. (in voluntary liquidation), at Hounslow, and of retailers at 68, Piccadilly, W., and 59, Cornhill, E.C. Nom. Cap.: £5,000.

PROCERA PRODUCTS, LIMITED. Copthall House, Copthall Avenue, E.C. 2. To carry on the bus. of mnfrs. of and dlrs. in bread, flour, confectionery, etc. Nom. Cap.: £2,500.

RIVERSIDE CONFECTIONERY PRODUCTS, LIMITED. 3 to 11, Darwin Road, South Ealing, W. 5. To take over the bus. of wholesale and mnfg. confectioners cd. on by L. Lawrence and J. Stapleton at Hammersmith, W. Nom. Cap.: £5,000.

SOHO MINERAL WATER SUPPLY, LIMITED. 1a, Helena Street, Smethwick. To carry on the bus. of mineral and aerated water mnfrs., etc. Nom. Cap.: £500.

The above-mentioned particulars of new companies recently registered have been extracted from the daily register of Messrs. Jordan and Sons, Ltd., company registration agents, Chancery Lane, W.C. 2.



These particulars of New Patents of interest to readers have been selected from the "Official Journal of Patents", and are published by permission of the Controller of H.M. Stationery Office. The "Official Journal of Patents" can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

Latest Patent Applications

13424. NICORESTI, C. A. COFMAN-: Preservation of edible fungi. May 7.
13578. IREKS AKT.-GES.: Production of preparations for nutritive purposes. May 8. (Germany, May 8, 1934.)
13918. DAVIES, T. E.: Heat treatment of tins, etc., containing food. May 11.
14088. DOE, B. L.: Method of slicing bread, etc. May 14.
14102, 14103. VICKERS, H.: Manufacture of meat rolls. May 14.
14167. FEATHERSTON, J.: Containers for food, etc. May 14.
14191. BEECH'S CHOCOLATES, LTD., and COLLINSON, E. W.: Storing, etc., sweetmeats. May 15. (July 18, 1934.)
14324. MILCH-INDUSTRIE AKT.-GES.: Production of substances from sterilised, etc., milk. May 16. (Hungary, April 1.)
14325. MILCH-INDUSTRIE AKT.-GES.: Process for prolonging the stability of yoghourt, etc., milk products. May 16. (Hungary, March 9.)
14328. NATIONAL EQUIPMENT CO.: Apparatus for handling starch in confectionery manufacture. May 16. (United States, July 19, 1934.)
14361. MAIN, J. A.: Withering tea. May 16.
14439. ROBINSON, S.: Bin for storing, etc., foodstuffs. May 17.
14506. HOTPOINT ELECTRIC APPLIANCE CO., LTD., and LEEVERS, F. W.: Electric toasting, etc., devices. May 17.
14626. BLAIRS, LTD., and DOUGLAS, A. A. H.: Conveyors, etc., for sugar-cane mills. May 18.
14756. GREEN AND CO., LTD., H. J., and GREEN, H. J.: Beverage crystals. May 20.
14977. ROACH, W. A.: Concentration of fruit, etc., juice. May 22.
15185. INTERNATIONAL PATENTS DEVELOPMENT CO.: Production of dextrose. May 24. (United States, April 17.)
15190. INTERNATIONAL PATENTS DEVELOPMENT CO.: Crystallisation of dextrose. May 24. (United States, April 1.)
15741. BACKER, P. J. DE, and TYBERGHEIN, E. C. E.: Manufacture of coffee. May 30.
15807. HUZENLAUB, E. G.: Manufacture of milk liquids. May 30.
15948. BARR, M.: Treatment of coffee. June 1.
16046. STAPLES, H. H.: Containers for food, etc. June 4.
16089. FENBY, E. B.: Apparatus for hygienic supply of milk, etc. June 4.
16163. PROCHOROFF, V.: Preservation, etc., of slaughtered animals. June 4.

Complete Specifications Accepted

428,044. STANDARD BRANDS, INC.: Vitamin concentrates. (November 26, 1932.)
428,048. PROCTER AND GAMBLE CO.: Edible fats and fatty oils.
428,110. FOOD MACHINERY (M. AND P.), LTD., and JONES, Q. R.: Means for removing the eyes of pineapples in the preparation of the fruit.
428,347. BLEECK, J.: Preservatives for animal and vegetable substances.

FIG. 1.

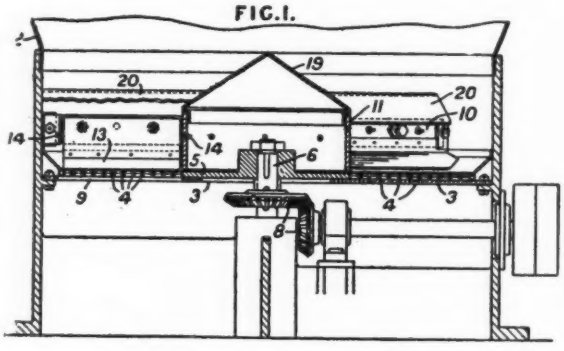
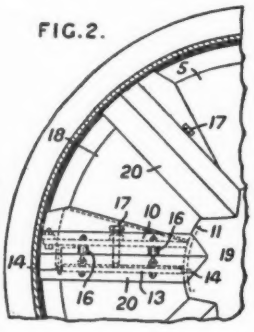


FIG. 2.



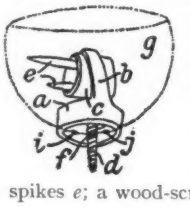
428,554. GASCOIGNE, G. H., and KNOX, J. R.: Liquid-filtering means, particularly for filtering milk.
428,607. MACFARLANE, R. F., and BAKER PERKINS, LTD.: Discharging of biscuits or the like from wires, pans, or trays, and associated operations.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

Abstracts of Recent Specifications

Group Abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, either sheet by sheet as issued on payment of a subscription of 5s. per Group Volume, or in bound volumes price 2s. each.

423,882. GROUP XVII. **Cooking canned food.** LAING, J., 30, Digswell Road, Welwyn Garden City, Hertfordshire.



A venting device for facilitating the cooking of canned food comprises a metal collar *a* above which is mounted by arms *b* a cylindrical part *c*, from one end of which project two spikes *e*; a wood-screw *d* attached by the head to the under-surface of the part *c* projects downwardly through the collar and is passed through an opening *f* in a rubber cup *g*, adjacent openings *i*, *j* being provided. In use, holes are punched in the end of the tin by means of the spikes, one being in the centre of the end, and the device is attached to the tin by inserting the projecting part of the screw into the central hole.

425,885. GROUP VI. **Tea manufacture.** KRUPP GRUSONWERK AKT.-GES., F., Buckau, Magdeburg, Germany.
A machine for cutting dry rolled tea leaf has a revolving plate 5 provided with holes 4 for accommodating the rolled leaf, with non-revolving cutting blades 13 above it and a stationary bottom plate 3 below it. The rolled dry leaf in the hopper 2 passes over the cone 19 and covers 20 into compartments 18. The leaf falls into the holes 4 of the plate 5 and projects from the top of the plate 5. When the plate 5 is rotated about its axis 6 by the bevel gears 8, the knives 13 shear the leaf and the portions in the holes 4 are carried above discharge openings 9 in the plate 3 and drop into a container. These openings are closed by the covers 20 to prevent uncut tea leaf from dropping through from the hopper. The blades 13 are mounted on rods 14 secured to the ring 11 and blade-supporting arms 10 so as to be capable of tilting if they encounter a hard foreign substance in the leaf. Springs 16 return them to cutting position and stops 17 limit the amount of tilt.

425,980. **Superglycerinated plastic shortenings.** PROCTOR AND GAMBLE CO., Ivorydale, Hamilton County, Ohio, U.S.A.
Shortenings for cakes and biscuits permitting incorporation of 150 to 175 per cent. sugar (calculated upon the weight of flour), with a correspondingly increased content of milk or other liquid ingredient are claimed to result from reaction of a plastic triglyceride fat with enough glycerine to give at least 0·3 per cent. excess of combined glycerine over that required for triglyceride formation, but less than that corresponding to the diglyceride. When prepared with ordinary commercial shortening agents, cakes made with 50 per cent. more sugar than flour are poor in texture and lack volume (*i.e.*, are said to be "sad"). With the new superglycerinated shortenings, light, tender cakes are claimed to be obtained with the considerably increased proportions of

sugar and milk indicated above, while the products also resist staleness for a longer period. The process is particularly useful, it is stated, in connection with hydrogenated fats. Example: Hydrogenated cottonseed oil (iodine value 70) is deodorised by steaming and then shaken with 10 per cent. glycerine in a nitrogen atmosphere at 240° C. for one hour at normal pressure. After cooling to 60° C. and settling, the lower layer of glycerine is drawn off for re-use and the layer of superglycerinated fat is filtered through kieselguhr and made plastic by the usual chilling and mixing procedure. (Convention date, United States, February 4, 1933.)

426,729. **Beer-like beverage with very low alcohol content.** M. WAHL, 17 Prinzregentenstrasse, Munich; assignee of Herha L. Wohlmuth, 27 Luisenstrasse, Munich.

Yeast-like organisms of a hitherto unknown type which can be isolated from fruits and which are capable of inducing strong fermentation in beer wort without any appreciable decomposition of sugar and alcohol into carbon dioxide are specified in this process. For example, 100 hectolitres beer wort boiled with hops and produced by any known method and of a strength corresponding to 6 per cent. Balling or more are placed in a fermenting tub after cooling and then inoculated with the specified yeasts. After primary fermentation for four to six days the product is transferred to a cellar and there after-fermented for one to four weeks prior to aeration with carbon dioxide, bottling or casking, and pasteurising. Although the product essentially resembles beer in many respects, it contains only 0·2 to 0·3 per cent. alcohol. The new yeasts can be cultivated by the usual methods in a nutrition liquid derived from the juice of such fruits as the cherry, apple, and grape. Compared with *Saccharomyces Cerevisiæ* the cells of the new yeast culture are more elongated and the protoplasm is more granular. (Convention date, Germany, October 10, 1932.)

427,677. **Spice extracts.** CONTINENTAL CAN CO., INC., 100, East 42nd Street, New York City, New York, U.S.A.

By subjecting aromatic vegetable tissues containing volatile essences to pressure treatment so as to rupture the cells without fully disintegrating the tissues, a mass of firm and extremely thin individual flakes is obtained, each preserving the original fibrous structure. It is claimed that a thinness of as little as 0·001 inch is practicable. Rapid extraction is thus rendered feasible. In a preferred form of process the spices are first rendered pliable by steaming or water spraying or tumbling with water in a warm room and then passed between hot rolls, from which they emerge in the form of almost transparent flakes. Vegetable tissues treated in this manner are said to yield up their aromatic principles in a very short time to the usual cooking, preserving, or extracting liqueurs. The flakes remain intact, thus avoiding the unattractive muddy appearance hitherto bound up with the introduction of masses of woody tissue into food products owing to the difficulty in separating the finely ground material from the resulting extract by filtration.

RECENT TRADE MARKS

This list of Trade Marks of interest to readers has been selected from the "Official Trade Marks Journal", and is published by permission of the Controller of H.M. Stationery Office. The "Trade Marks Journal" can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

ADVIT.—558,491 **Cereal flour.** The firm trading as WHITWORTH BROTHERS, Victoria Mills, Wellingborough, Northamptonshire. May 29.

"ANCHOR" FISH MEAL. — 556,129. **Fish meal for sale in the counties of Lincolnshire, Yorkshire, Lancashire, Norfolk, Suffolk, Essex, Nottinghamshire, Leicestershire, Derbyshire, Staffordshire, Rutlandshire, Northamptonshire, Huntingdonshire, Bedfordshire, Cheshire, Shropshire, Worcestershire, Herefordshire, Warwickshire, and Gloucestershire.** HAROLD SMITH, 47, High Street, Hucknall, Nottinghamshire. May 29.

User claimed from year 1928. Section 21.

Registration of this trade mark shall give no right to the exclusive use, either separately or in combination, of the words "New Process" and the device of a fish.

Fish meal will be struck out from the goods of Registration No. 466,288 (2509) if and before the applicant's mark is registered.

BARBER'S COFFEE. — 557,508. **Tea, coffee, cocoa.** BARBER'S TEAS (ESTAB. 1797), LTD., Teaplant House, Pershore Street, Birmingham, 5. May 22. (Associated.)

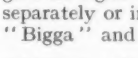
Registration of this trade mark shall give no right to the exclusive use of the word "Barber's".

In use upon goods other than coffee the mark will be varied by the substitution of the name of such goods for the word "Coffee".

BATCHELOR'S PEAS. — 557,112. **Peas for food.** BATCHELOR AND CO. (SHEFFIELD), LTD., Batchelor's Buildings, Stanley Street, Wicker, Sheffield. June 5. (Associated.)

Registration of this trade mark shall give no right to the exclusive use, either separately or in combination, of the word "Bigga" and the device of peas.

BATTLE AX. — 553,430. **Canned fish.** BRISTOL BAY PACKING CO., 141, Clay Street, San Francisco, California, United States of America. May 29.



Registration No. 387,282 (2152) will be cancelled if and before the applicants' mark is registered.

BAUBLE.—558,145. **Substances used as food or as ingredients in food, but not including spices.** ALLIANCE OF PRODUCE IMPORTERS AND NATIONAL WHOLESALE DISTRIBUTORS, 20, Mark Lane, London, E.C. 3. May 22.

BETTALADE. — 555,396. **Preserves (for food) made from apricots, oranges, and sugar.** The firm trading as PARSONS AND BENNETT, 1, Taylor Street, Hollingworth, near Manchester. May 29.

Registration of this trade mark shall give no right to the exclusive use, either separately or in combination, of the words "Parsons and Bennett's" and the device of a jam pot.

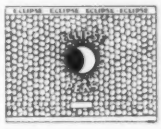
BRITISH HERRINGS. — B 553,547. **Canned herrings in tomato sauce.** THE SHIELDS ICE AND COLD STORAGE CO., LTD., The Shields Preserving Works, Fish Quay, North Shields. May 29.

User claimed from February 1, 1929.

The applicants undertake that this mark, when registered, and the marks Nos. 338,777 (1772), 391,996 (2358), 553,546 (2980), 553,548 (2980) and 553,549 (2982) shall be assigned or transmitted only as a whole and not separately.

BULLFINCH. — 559,680. **Canned fruits, canned vegetables, canned fish, canned meats, and dried fruits.** The firm trading as C. B. LINDSAY AND CO., 4, Cullum Street, Fenchurch Street, London, E.C.3. May 29.

ECLIPSE PEAS.—543,145. **Dried and preserved peas for food.** BATCHELOR AND CO. (SHEFFIELD), LTD., Batchelor's Buildings, Stanley Street, Wicker, Sheffield. May 22.



User claimed from July 17, 1908. Section 21.

Registration of this trade mark shall give no right to the exclusive use of the device of peas.

ERCO. — 559,264. **Confectionery.** ERCO PRODUCTS, LTD., Ryde Avenue, Beverley Road, Hull. June 12.

FETEX.—559,367. **Biscuits and shortbread.** GAVIN JACK FETTES, trading as G. J. Fettes, 67, Shawbridge Street, Pollokshaws, Glasgow. May 29.

The applicant undertakes not to use the cross device in red, or in white on a red ground, or in any similar colour or colours.

RECENT TRADE MARKS (continued)

FOUR-IN-HAND.—559,703. **Biscuits and chocolate confectionery.** GRAY, DUNN AND CO., LTD., 75, Stanley Street, Kinning Park, Glasgow, S. 1. May 29.

GENSCO.—558,767. **All goods in Class 42, which includes substances used as food or as ingredients in food.** THE SCOTTISH MILK MARKETING BOARD, 95, Bothwell Street, Glasgow. June 12. (Associated.)

GOLD FINDER.—559,512. **Butter, cheese, cheese containing fruit, cheese containing vegetables, cheese containing malt.** APLIN AND BARRETT, LTD., Newton Road, Yeovil, Somersetshire. May 22. (Associated.)

HERVIA.—559,424. **All goods in Class 42, which includes substances used as food or as ingredients in food.** HARRY JAMES LEE, 3, Alfred Place, London, W.C. 1. May 22. (Associated.)

HOUSE OF LOGAN.—557,736. **Bread.** RETAIL TRADES, LTD., 4, Broad Street Place, London, E.C. 2. May 22.

Registration of this trade mark shall give no right to the exclusive use of the words "The House of Logan".

JOHN PEEL.—560,100. **Sausage, pies, cakes, and cream.** CARRICK'S (CATERERS), LTD., 47, Grey Street, Newcastle - upon - Tyne. June 12.

The above-mentioned goods and goods of a like kind will be struck out from the goods of Registration No. 380,748 (2079) if and before the applicants' mark is registered.

JOHN SILVER. — 559,126. **Substances used as food or as ingredients in food.** SAML. HANSON AND SON, LTD., 14, Eastcheap, London, E.C. 3. June 5. (Associated.)

LEKFOSS.—559,870. **Substances used as food or as ingredients in food.** NATIONAL COLLEGE OF HEALTH, LTD., 208, Great Clowes Street, Broughton, Manchester. June 5.

MAADANAT BANI GHASSAN.—558,583.—**Coffee and flour.** THE ARABIAN TRADING CO., LTD., 27, St. Thomas Street, London, S.E. 1, and Esplanade, Crater, Aden, Arabia. June 12. (Associated.) (By Consent.)

Registration of this trade mark shall give no right to the exclusive use of the letters "A.T.C."

The translation of the foreign wording appearing on the mark is "Maadanat", meaning "Minaret", and "Bani Ghassan", meaning "Sons of (or Descendants of) Ghassan".

MACHINE SKIMMED.—557,548. **Condensed milk.** HAROLD GORDON LOCKWOOD, trading as H. G. Lockwood and Co., 44 and 46, Mulberry Street, Liverpool, 7. June 5. (By Consent.)

MATISAN.—559,869. **Substances used as food or as ingredients in food.** VICTOR FRANCIS BOORD, trading as Victor Products, 7, Pierpoint Street, Worcester. May 29.

MELWING. — 557,966. **Essences (non-alcoholic) and flavourings (non-alcoholic) all for use as ingredients in food.** MEX PRODUCTS, LTD., Imperial Works, Leyton Green Road, Leyton, London, E. 10. May 29.

"MENDIP" MILK.—559,072. **Condensed sweetened machine-skimmed milk.** WILTS UNITED DAIRIES, LTD., Bythesea Road, Trowbridge, Wiltshire. June 12. (Associated.)

Registration of this trade mark shall give no right to the exclusive use of the word "Mendip".

The applicants undertake to use the mark only on condensed milk manufactured in England from milk produced in the Mendip Hills district of Somerset.

MIC-MAC.—559,315. **Syrup for use with waffles.** MINISTRY OF AGRICULTURE OF THE PROVINCE OF QUEBEC, Parliament Buildings, Grand Allee, Quebec City, Canada, and Adelaide House, King William Street, London, E.C. 4. June 5. (By Consent.)

MOLZO.—559,475. **Beverages (not alcoholic, not aerated, and not medicated), and preparations for making beverages.** SETON VEITCH COATS, 16a, Blythswood Square, Glasgow. May 29.

Registration No. 553,615 (2950) will be cancelled if and before the applicant's mark is registered.

MURCOLL.—559,207. **Canned meat and canned fish.** D. AND W. MURRAY, LTD., 28, Finsbury Street, London, E.C. 2. May 29.

MUSHARTO.—559,729. **A sauce made from mushrooms and tomatoes.** F. B. ESTCOURT, LTD., 45, Gaylor Street, Manchester, 10. May 29.

NESTRO-VITE. — 559,294. **Substances used as food or as ingredients in food.** NESTLÉ AND ANGLO-SWISS CONDENSED MILK COMPANY, Cham and Vevey, Switzerland, and St. George's House, 6 and 8, Eastcheap, London, E.C. 3. May 22. (Associated.)

PATE ROLL. — B 553,549. **Ham and chicken roll, being canned goods.** THE SHIELDS ICE AND COLD STORAGE CO., LTD., also trading as TYNE BRAND PRODUCTS, The Shields Preserving Works, Fish Quay, North Shields. May 22.

User claimed from June 1, 1931.

The applicants undertake that this mark, when registered, and the marks Nos. 338,777 (1772), 391,996 (2358), 553,546 (2980), 553,547 (not yet advertised), and 553,548 (2980), shall be assigned or transmitted only as a whole and not separately.

PIED PIPER.—557,850. **Boiled sweets, toffees, chocolates.** G. W. AVISON AND CO., LTD., Wharf Confectionery Works, Market Road, Doncaster. May 22.

Registration of this trade mark shall give no right to the exclusive use of the word "Avisons".

In use upon goods other than chocolates the mark will be varied by the substitution of the name of such goods for the word "Chocolates".

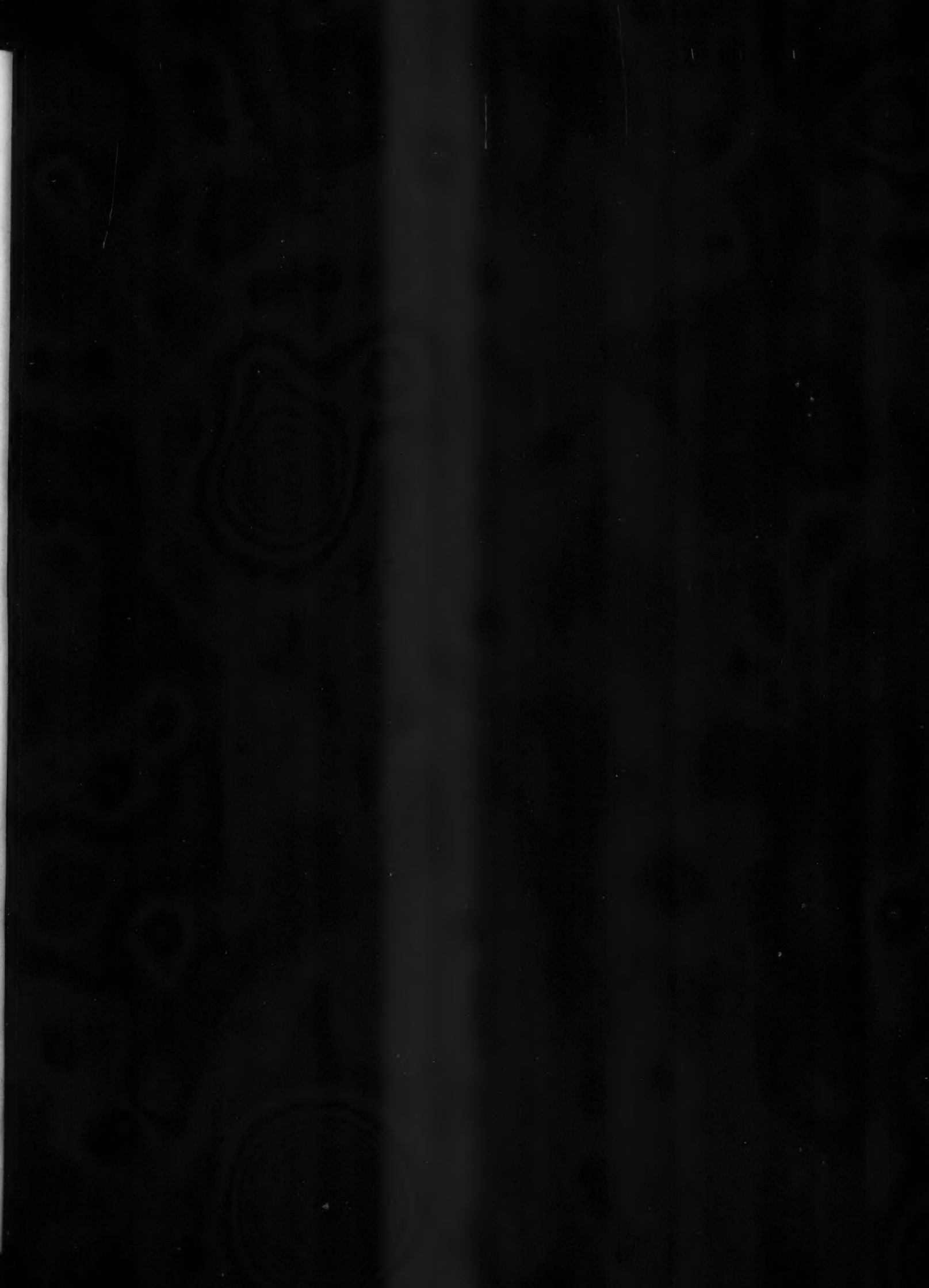
PINDO. — 556,696. **Grapefruit, oranges, and lemons.** ARGENTINE NORTH-EASTERN RAILWAY CO., LTD., River Plate House, Finsbury Circus, London, E.C. 2, trading also in the Argentine Republic as FERROCARRIL NORDE ESTE ARGENTINO, Cangallo Street, No. 564, Buenos Aires, Argentine Republic. May 29.

PLATTER.—559,911. **Flour and bread.** THE NATURAL FOOD CO., LTD., 210, 212, and 214, Cambridge Road, London, E. 2. June 5.

PROCEA. — 556,425. **Bread, flour, biscuits, rusks, and cereal foods.** PROCERA BREAD PROCESS (NEW ZEALAND), LTD., Australasian Mutual Provident Society Buildings, Featherston Street, Wellington, New Zealand. June 5. (Associated.)

QUAKER.—559,423. **Cereals for use as food.** THE QUAKER OATS COMPANY, Board of Trade Building, 141, West Jackson Boulevard, Chicago, County of Cook, Illinois, United States of America. May 29. (Associated.)

REGENCY.—559,739. **Tea and coffee.** GLORIA PRODUCTS, LTD., 104, Park Street, Regent's Park, London, N.W. 1. May 22.

ROCKSIDE.—559,691. **All goods in Class 42, which includes substances used as food or as ingredients in food.** BURTON, ALLTON, LTD., Castle Boulevard, Nottingham. June 5.

ROMARINA.—559,585. **Preparations for making fruit and the like beverages, and coffee, coffee compounds, and coffee essence.** K. DEAN-DAVIES AND CO., LTD., 35, Dale Street, Liverpool. May 29.